



INDUSTRIAL-ARTS MAGAZINE

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INDUSTRIAL-ARTS MAGAZINE

Vol. V

MAY, 1916

No. 5

Our By-Product---The Prevocational Boy

Edith Brown, Lane Technical High School, Chicago



COUNTRY-WIDE interest is awake to the problem of transforming into a commendable by-product, the waste material which the rigid organization of our elementary school is discarding daily. Many effective efforts are being directed toward the retention in school for a longer educational experience, that vast majority of our children, namely, the laggards in the grades, who are finally eliminated before graduation.

The educational scrapheap has reached such alarming proportions that its reclamation has become a matter of the most vital consideration in the present movement toward genuinely democratic education.

From statistics in the 1911-12 Annual Report of the State Superintendent of Public Instruction in Illinois, it appears that there were in the State at that time about eight times as many children in the sixth grades of the public schools as there were in the last year of the high school, and that Cook County had ten children in the sixth grade to one in the fourth high-school year.

A report of the Chicago Board of Education for the same year shows that the four high-school years claimed only one-fifth as large a membership as the last four elementary grades.

That a similar condition obtains thruout the United States is evidenced in the statement of the Commissioner of Education, that only 26 per cent of the country's white children receive any high-school training whatsoever.

From such statistics as the foregoing, two conclusions are obvious: First, the *majority* of our young people enter upon their occupational experiences without even a grammar-school training. Second, the public school is failing in its full duty to those who need its services most vitally.

The peculiar needs of this particular group are receiving wide attention, and various plans for meeting these needs have been tried experimentally. One of the most successful of these efforts, and the one which has been my especial interest, is quite generally called prevocational education. It had its inception in the East about nine years ago and has spread across the entire continent, three or four excellent prevocational schools having been

organized on the Pacific Coast, and other examples being found in every section of the country.

The purpose of prevocational education is dual: First, to retain children in school for a longer period; and second, to adjust the regular school methods and the regular school subjects as well, to the requirements of this group. It is intended that the work shall be appropriate for pupils who are mature enough to do the work usually found in grades seven and eight, or, in other words, children from 13 to 16 years of age. While it abandons preparation for high school as a major purpose, it usually permits its pupils to enter that institution on the completion of certain necessary work.

To appreciate the value of such adjustment and organization, it should be recalled that, while the vast majority of these children are behind their grades, and whether they are retarded on account of illness, economic stress, or lack of interest in school work, they *must not* be considered sub-normal. They are not inferior to, altho, perhaps, different from the type of pupil who makes the required reactions and measures up to certain fixed standards of the traditional school. Sub-normal or defective children should not be considered as candidates for prevocational methods of education. Under appropriate stimuli the reaction of retarded children is satisfactory.

It should also be said emphatically that these children are generally strongly interested in manual training work, tho too frequently they have had no chance to receive such instruction before entering the prevocational class. Therefore it will be apparent that the institution of a liberal amount of hand work, and the utilization of all existing manual-training courses wherever possible, is of immense value in handling the prevocational classes. In fact the day's work is frequently divided equally between academic subjects and shop activities.

The *organization* of prevocational classes, departments or schools requires a word of explanation. Sometimes the prevocational class is found in an elementary school building and is considered as an integral part of its organization. Sometimes the work is carried on in a separate building serving several elementary schools and having its comple-

ment of teachers, both shop and academic. Sometimes, as at the Lane Technical High School, it is organized as a department of the high school itself, tho in grade it is below the freshman year.

My experience as a teacher of academic subjects would not qualify me to discuss this matter before a group of manual-training experts, were it not for two considerations both of which give me some confidence that my message may not be inappropriate.

First, there is a conviction in my mind that the shop teachers, coming as they do into close, personal contact with their pupils, will be in sympathy with the conception that the prevocational boy is worth saving.

Second, it seems to me that certain plans of action which have been evolved in my experience with these boys, in the course of their academic work, may be applied to the shopwork, or, failing that, may contribute a new point of view regarding the retarded boy's needs, capacities, attitude and character.

Two definite ideas have developed gradually in my mind and have shaped all my work in organizing courses for these boys. They are these: First, that in all school work, first consideration must be given to the fact that there is probably but a short time remaining to them of school life. The second is that the standards by which their school work is to be judged must be individual, and must be set with due regard to the personal characteristics and conditions of the boy in question. In short the individual pupil's *limitations* should dominate the teacher's plans and also his judgment,—limitations as to time, capacity, rate of progress, and accomplishment.

An example chosen from the subject of history will serve to illustrate both these points.

Many of these boys come to us, at 14 or 15 years of age, never having had any instruction in history. At best they will have only one or two years of such formal courses as the high school gives, as for example "ancient history," even if they stay four years in that institution, for their predilection is for technical work. But the probability is strong that many of the boys will never have *any* history in their school experience except that which we are to give them within the year, or two years, in the prevocational class. Under these circumstances what shall we do for them?

The *principle of time limitation* determines what things shall be taught. It directs the emphasis to the fundamentals of economic and social life, with occasional reference to the less essential political and military facts, with which the ordinary school history usually contents itself.

For example, at the Lane Technical High School we are giving a course which presents certain phases

of the present-day phenomena, easily observable by everybody, together with the interpretation of them. This includes some very elementary economics; simple discussions regarding the worker's status; reference to labor problems; investigation of factory work and factory conditions; a study of health, public and industrial; and a study of various civic institutions.

These present-day phenomena are contrasted with their counterpart in primitive times as a basis for genuine interest in things historical and, of course, liberal reference is made to pertinent facts, chosen with discrimination, from Colonial and United States history. We do not dare to turn these boys out from the school without at least attempting to establish a curiosity about these all-important phenomena, a dynamic interest which may carry them far in later life.

The foregoing illustrates an application of the idea of deferring to *time limitations*. To follow the idea of deferring to *individual limitations*, that is to differences in interest, capacity, and rate of progress, care is exercised in the assignment of various tasks, or *research work* as one of the boys called it. For example, the boy who has a gift for interviewing people may be sent out to visit an industrial plant or some public institution, such as the office of the Smoke Inspector. His duty is to bring back live and instructive reports which may serve as illustrations for some topic which is being studied in history, or as a basis for discussion. The artist is encouraged to illustrate his written work. The boy who is an excellent penman may sometimes collaborate on a piece of note-book work with one who has the ability to furnish data, or with another who is more proficient in diagrammatic expression.

It may be objected that economics is too difficult for boys who have had difficulty in getting thru the upper elementary grades, but it may well be questioned whether economics, in its fundamentals, is more difficult to understand than most of the technical grammar and much of the mathematical reasoning which go to make up the traditional grammar-grade courses. When one contrasts the *interest* shown by the boys in this kind of history with that shown, (or not shown), in grammar, the relative difficulty of the subject will be forgotten.

It may also be doubted whether enough information can be given to boys of this age to make any lasting impression on them; whether, after all, work of this nature is not merely *entertaining*. To this query the reply may be made that there is seldom any marked evidence, in later life, that rigid rules of grammar, dates of battles, the formulae for solving mathematical puzzles have been retained in the memory of the ordinary individual, from his educational experiences prior to his 15th or 16th year.

More important than facts is the *point of view*

which the growing boy gets regarding the activities of these groups of people which we speak of as the city, the state, or the nation. It is surprising how this point of view may be given even to a 15-year-old prevocational boy.

Illustrations might have been drawn from our modified courses in English, general science, or mathematics, but history has been chosen because it appeals to me as the most fundamental of all studies if given in this way.

While claiming no right to an opinion on technical matters, I cannot help feeling that principles relative to time limitation and capacity limitation may be applied to the shop courses in much the same way as to the academic work. Carefully planned courses, uniform for all and reaching forward into the dim future, clearly are not for these boys. Rather should they be given, or so it seems to me, a taste of real work, genuinely related to the life the boy knows, and which will prepare him, in some fashion, against that not-far-distant day when he will find his school life ended, and the problems of earning a living substituted for the simpler problems of the schoolroom. As in the academic work, the shop teacher should look for wide differences in individual interest, ability, rate of progress and accomplishment. The reward of his efforts with the class will come with the conviction that each pupil has *succeeded* in the best way possible for him.

In this connection it may be well to note that the shop equipment should be as varied as possible. In the prevocational department of the Milwaukee School of Trades, for example, there is, in one room, a diversified equipment affording opportunity for work in the elements of several mechanical trades. This is decidedly preferable to the large, uniform equipment so frequently found in the traditional manual training room, at least so far as prevocational work is concerned.

Again disclaiming any technical knowledge regarding the matter, it has been my experience that the same kind of shopwork should not be required of all, and that the best results are reached, educationally, when due regard is had for variety, flexibility, and the utilization of special ability when discovered, even tho it be only the ability to keep a certain machine clean and bright, or to keep the shop in order.

As illustrative of variety and of practical work in the shops, I will give two quotations from the paper of a prevocational school.

We have lately read in the papers that the stores have taken account of stock, so we decided to do the same. We wished to find how many orders had been filled; also how much work we had on hand.

The following orders were shipped before March 1: 500 basket bottoms, assorted sizes; 78 straw-board photo-frames and 1000 splints for the special classes; 400 pieces shellaced news-board, 19 in. by 13 in., to the clay modeling department; 26 equipment trays and 72 threaded dowels with 72 wooden nuts tapped to match, to the lower grade normal training classes; 5 boxes with hinged covers and 48 square plinths, 4 in. by 1 in., to the drawing department; 100 topographic cloth-mounted

maps of the United States to the Normal School; 12 drawer runners to the Blank Prevocational Center; 1000 notebook covers to the supply rooms; 29 trays to hold bench plans and 47 boxes to hold plane irons for our center.

We have the following orders to fill before school closes: 96 basket bottoms; 12 photo-frames, 4000 splints, and 150 alphabet boxes for the special classes; 3 modeling trays and 700 busy-work boxes for the lower-grade manual-training classes; 4 boxes with hinge covers, to hold type solids, and 61 maple tool-racks for the manual training classes.

One of the teachers in our school had an old watering-pot which she thought was ready for the ash-heap. I took it to the shop-room to see what could be done with it. I found holes, rust, and dents in the bottom. I took off the bottom, put on a new one, hammered the dents from the sides, and put on a coat of black paint which made it look like a new one. I returned it to her and she was much surprised to find that it was her old watering-pot which she did not recognize at first.

In conclusion I must come back to the consideration of the personal characteristics of prevocational boys. The vital thing cannot be done for these children unless there is the warmest sympathy and the heartiest spirit of co-operation between the pupils and the teacher, and such sympathy and co-operation are utterly impossible unless the teacher is willing to study the personality of each pupil. It is with the hope of adding something more to the shop teacher's already wide knowledge of this particular type of pupil, that I venture to present to you a few extracts from the personal histories and testimonials which have come into my possession in the course of my work with these most interesting children at the Lane Technical High School.

Typical.

Personal Statements.

I am glad I came to Lane because I am not having half as much trouble. The reason I left grammar school is because everything I did seemed to go wrong with my last teacher. First, February came and I didn't pass. Then came June and I didn't pass. So I got disgusted.

I left the Blank School because I was too big for those small girls and boys. The teacher and I had many complaints against each other.

Energy to Spare.

In my leisure hours I go down into the woodshed and work on whatever I feel like working on. In the last two weeks I took up all the planks, shovelled out all the dirt necessary to deepen the ground so I could lay bricks. I got some cinders and bricks and paved the shed.

Size.

I left grammar school because my teacher said I was too big and that disappointed me very much. I feel down and in. I was big already in the seventh grade. I was one inch from six feet tall, and one thing was very bad I could not buy short pants.

Preferred Another Tune.

I felt that I did not care for the grammar school because of its "inabilities" for shopwork. I heard of the advantages of Lane. Most of my troubles came from my not knowing my notes in singing.

Poverty. Certainty of Short Course.

I think money is more scarce now in our home

than it ever was before. I hope the time will come soon when I can work and my mother and me will not have to worry about eats and so forth. But I think I am having a far better education than my brother. He had to go to work when he was fourteen. There is one thing, I know, if I can go to high school that I can only take a two-year course for after that I will have to go to work.

Preferences Even in Shopwork.

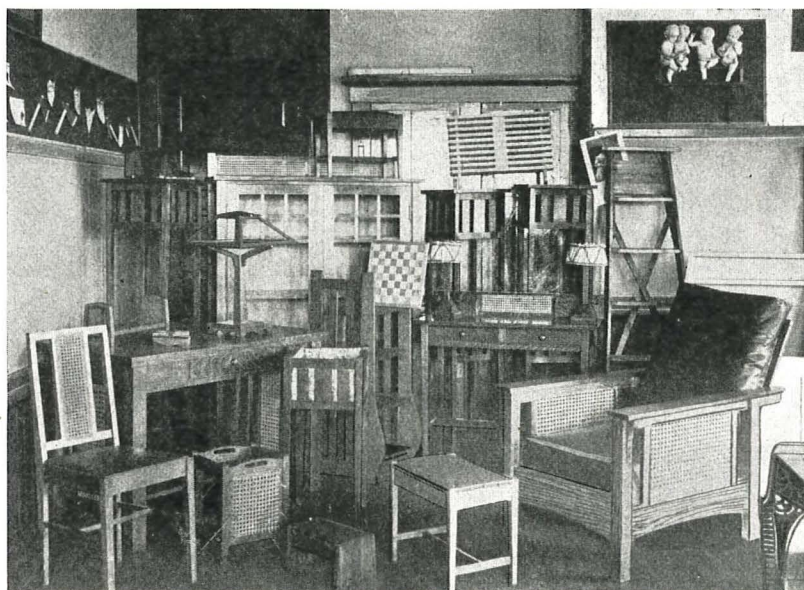
This has been the most unlucky year of all. I lost my father and my uncle in six months. Everything seems to go wrong.

I thought I would like to go to Lane because I am so far back in my grades. And I came here and I like everything here but forge, which I wish I did not have to take, for I know I never will have to be

a blacksmith. I want to be a mechanic because I was born with the knack to be a mechanic. I can do anything in that line. I am a good carpenter and have everything of tools there is to be had. I hope to make a good living with them some day. When I was small I bought tools one by one and now I have a great collection.

I made an aeroplane that flew 165 feet at the Coliseum. It was three feet long.

To meet the needs of children such as these has come to be a mutual interest and a mutual responsibility for shop teacher and academic teacher. It appears to be a fact that the shopwork and the bookwork should have as much relation to each other as possible.



Woodwork by Freshmen and Sophomores in Manual Training Department, Stewartville Public Schools, Stewartville, Minn. Walter E. Durbahn, Instructor.

AN AMATEUR WIRELESS SET

James Kennedy, Pittsburgh, Pa.

The Sending Station.



THE sending station of a small wireless set is shown in the general diagram. To send a message, you need a spark coil, telegraph key, spark gap, vibrator and a condenser. The spark coil consists of

two windings around an iron core. The batteries are connected in series with one of these windings, called the primary. The terminals of the other windings, called the secondary, are connected with the spark gap. When the telegraph key is pressed the iron core becomes magnetized, due to the current in the primary, and as a result, attracts the iron armature which is held away from the core with the spring B. This movement results in the contact at C being broken, and the primary current drops to zero. The iron core loses its magnetism. The armature returns to its position, completing its circuit at C, and the process repeats itself. The condenser is used to do away with the arc formed at C.

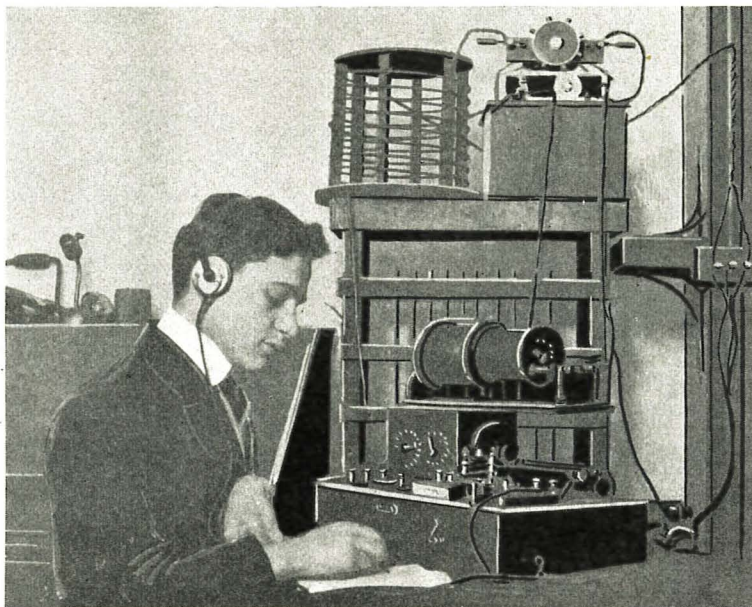
To build a spark coil, make a paper tube eleven inches long and one inch in diameter. Fill this tube with 24-gage soft iron wire. Wrap this core with a good quality of twine, the turns to be placed neatly together. Boil in paraffine. The primary winding is to be made next, which consists of three layers of number sixteen gage, double cotton-covered magnet wire wound to within $1\frac{1}{2}$ inches of each end. Leave ten inches of wire at each end for connections. Boil in paraffine again.

Secondary winding is now ready, and must be well insulated from the primary winding. This can be done by either making a paper tube or a glass tube fit tightly over the primary winding. The secondary consists of six one-inch sections. They are wound on the device shown. Connect them in series so that the outside wire of the first section shall connect the beginning or inside wire of the second. Wind the wire on the device as tho winding a spool of thread. For each section about six ounces of

number 34-gage, single silk-covered magnet wire will be needed. Slip these sections, which are first boiled in paraffine, over the insulation. This completes the spark coil. The spark coil can be put in the box shown in the illustration.

The condenser is made by placing a sheet of tin foil on a sheet of paper or glass, with small strips

of tin foil for making connections. Be careful, in this condenser, to use only one strip of tin foil on each sheet of tin foil. It is built like this: A strip of paper is laid on a board; a sheet of tin foil is placed on the paper or glass, then a small strip of tin foil is placed on top of the tin foil as shown at A; another sheet of paper, a sheet of tin foil and a connecting strip are placed on the opposite side. You will need about 30



A Wireless Set in Use. Made by the boy under the author's direction.

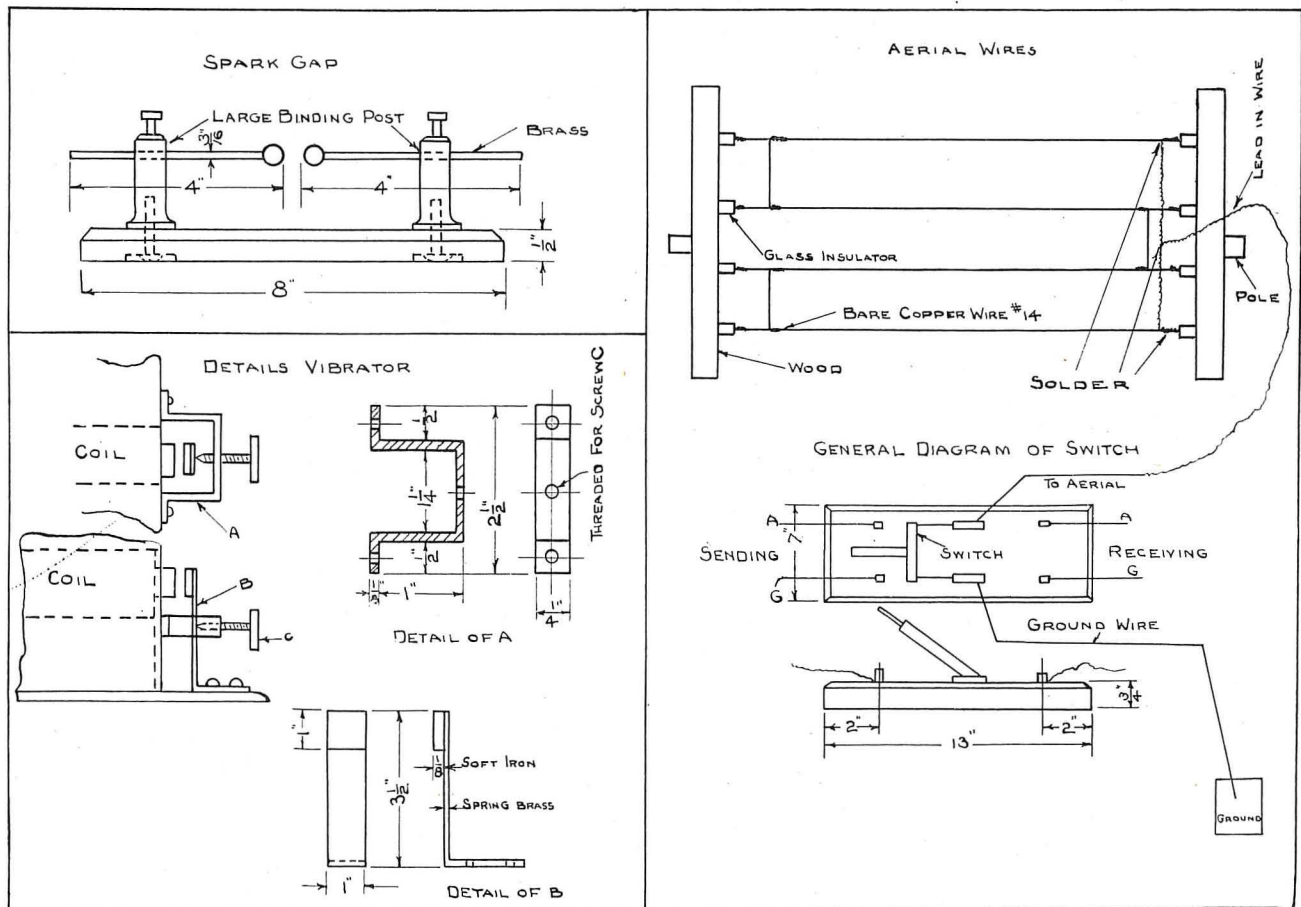
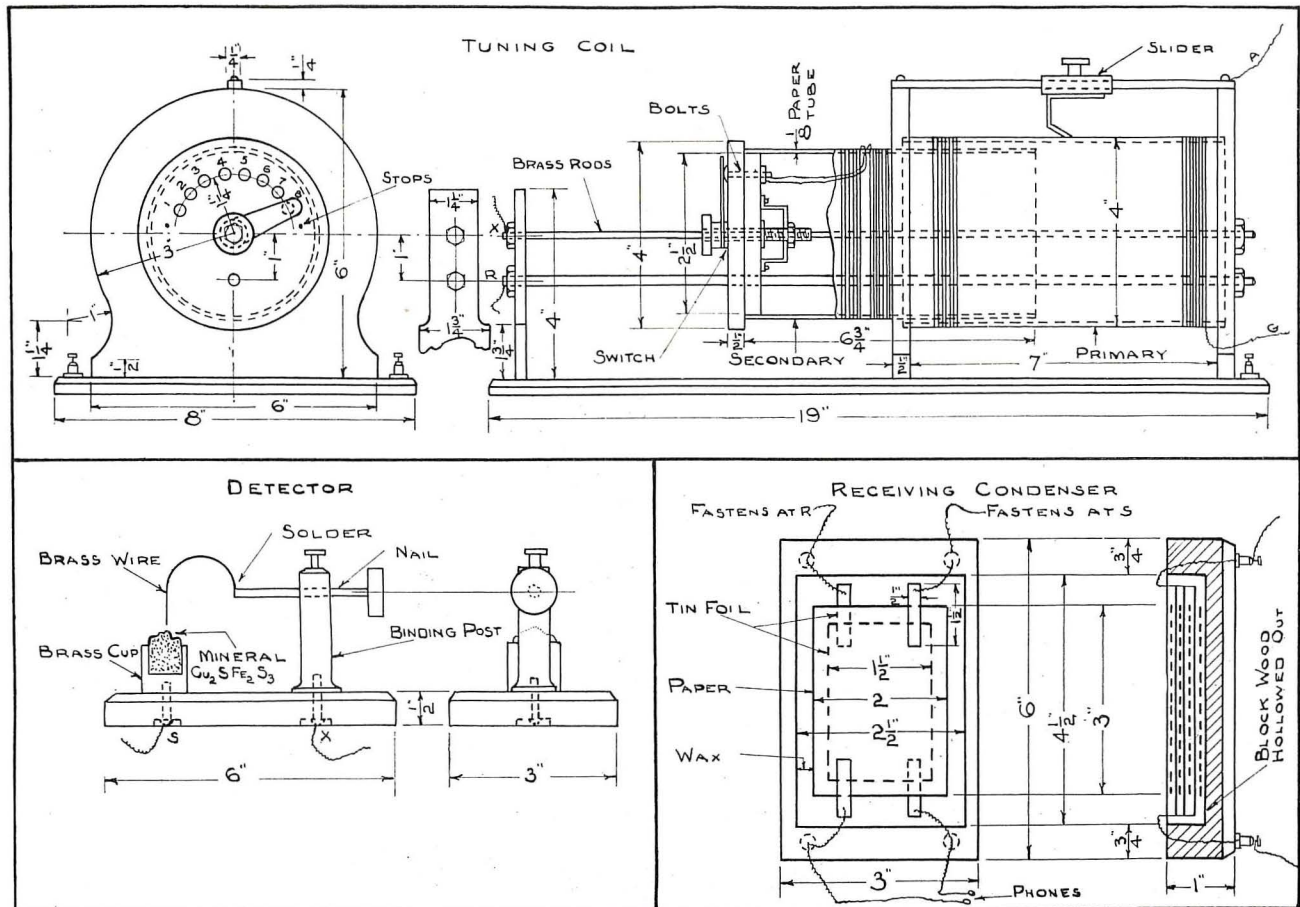
sheets of tin foil. The operation is the same for the rest of the sheets. Boil the whole condenser in paraffine and place in a box.

The spark gap and vibrator need no explanation. The aerial wires and the aerial switch can easily be made from the drawing.

The telegraph key can be purchased for less than it costs to make. This completes the sending station.

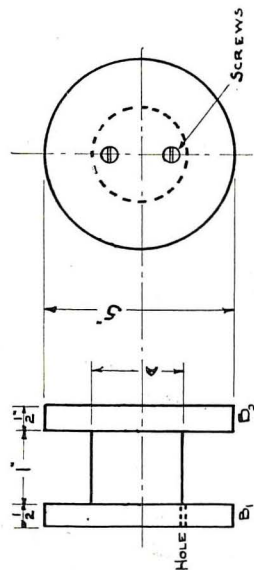
The Receiving Station.

The most important part of the receiving set is the Tuning Coil. It consists of a primary winding on a cylinder of paper, with the secondary winding on another cylinder, so arranged that it can be moved in and out of the primary winding. The details of construction are as follows: Shape two pieces of wood which are six by six inches, as shown in drawing. Turn a groove, $\frac{1}{4}$ -inch deep, and $\frac{1}{8}$ -inch wide, in the surface of each piece, so that the paper tube will fit exactly. Wind 20-gage single cotton-covered copper wire on the cylinder to within $\frac{1}{2}$ -inch of one end, and to $\frac{1}{4}$ -inch of the other end. One of the six-inch square boards must have an opening so that the secondary can move in and out of the primary. In winding the wire on the primary, start $\frac{1}{4}$ -inch

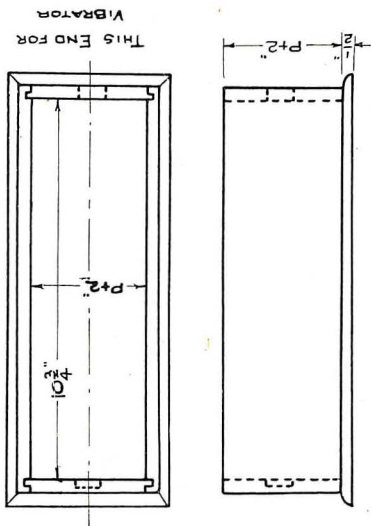


WORKING DRAWINGS FOR A WIRELESS OUTFIT.

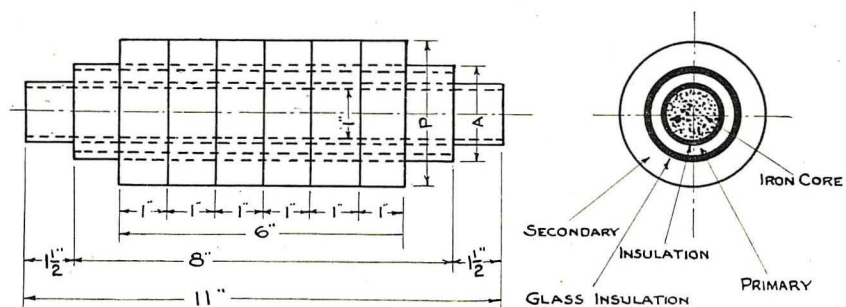
DEVICE FOR WINDING SECONDARY SECTIONS ON LATHE



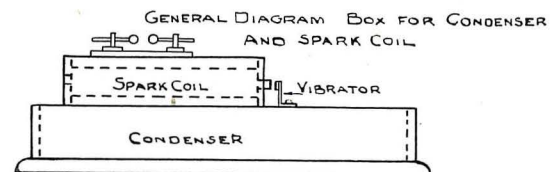
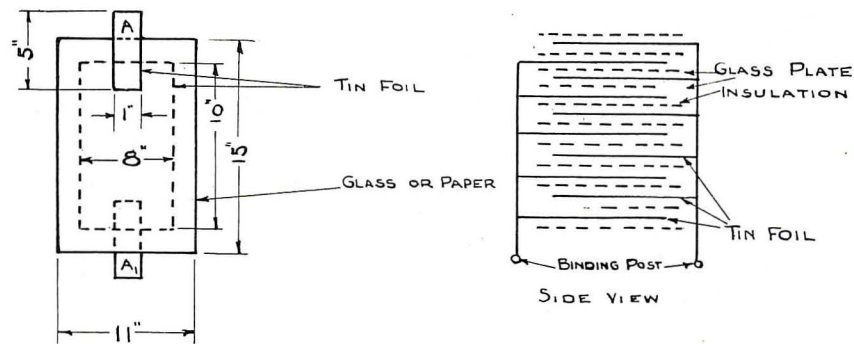
Box for Coil



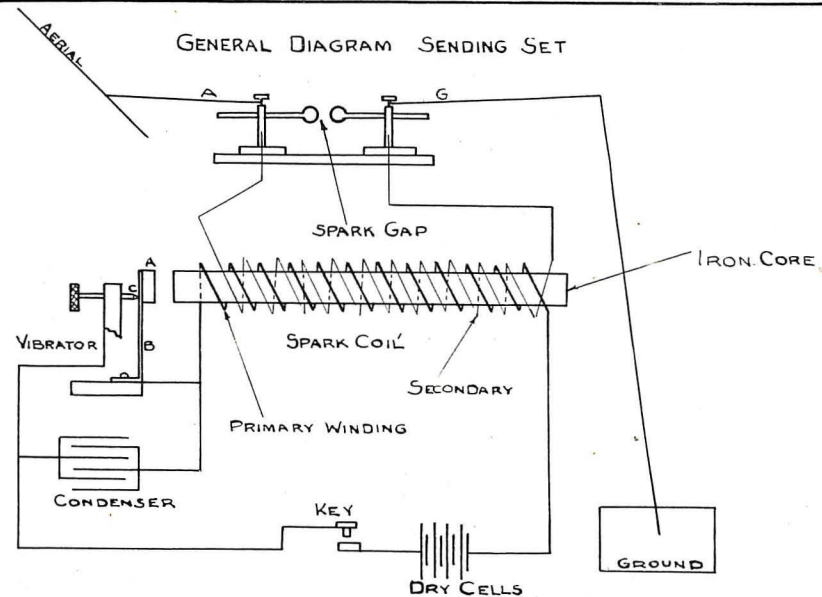
SPARK COIL

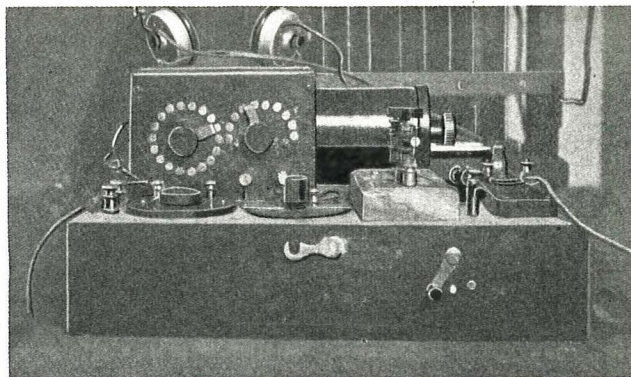


DETAILS OF A CONDENSER



GENERAL DIAGRAM SENDING SET





Receiving and Sending Set.

from the end of the board without the opening. Leave about six inches of wire protrude at this end for connections. Wind the wire tightly on the paper cylinder to within one-half inch from the end with the opening. Fasten the end of the wire by drilling a small hole in the paper tube, and drive a small wooden peg into the hole alongside of the wire to hold it in place. There are no connections to this end of the wire. Screw the slider in place, and sandpaper off the cotton, about one-half inch wide along the top, so the sliding contact will make a contact with the various turns of wire where the insulation has been removed. We are now ready to build the secondary.

The secondary consists of a paper tube which slides in and out of the primary. The winding should be made as follows: Use 22-gage single cotton-covered copper wire. Drill a small hole about three-quarters inch from the end opposite the switch. Pass twelve inches of wire down thru this hole and fasten with a wooden peg. Wind on the wire until you have covered one-half inch of the cylinder, then drill a small hole close to the winding. Make a loop in the wire you are winding. Pass this loop down thru the hole just drilled, and fasten the wire with a wooden peg. The loop should be about nine inches long. Proceed in this way until you have eight one-half-inch sections. The end of the winding farthest from the switch should be connected to the brass tube on which the handle is screwed. The loops in order, numbering them from this end of the winding, should be fastened to the bolts, placed in the holes, one, two, etc. The switch and other details can be made from the drawing. One of the binding posts is connected with the brass rod carrying the slider, and the other, to one end of the winding itself. This completes the Tuning Coil.

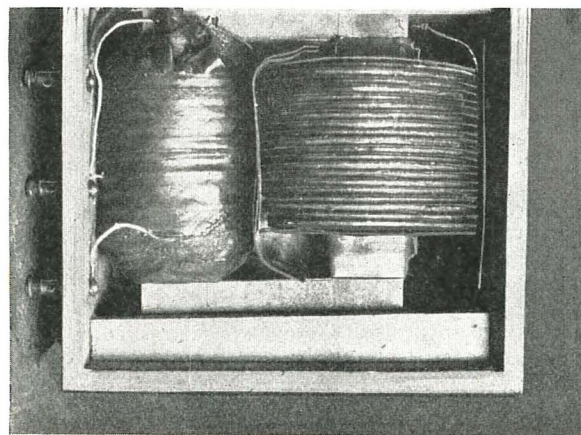
The receiving condenser is made with two strips of tin foil placed on each large sheet of tin foil on the

opposite corners; then a sheet of paper, etc. It is placed in a block of wood which is hollowed out, and wax poured over to keep it in place. The condenser can easily be made from the drawing. The detector can be made without any explanation.

The connections for the receiving set are easily understood by referring to the letters on the detail drawings. The continental code is the one used by all amateurs. This set, if constructed carefully, will send from ten to twelve miles and receive up to 500 miles. The photographs show the boy who constructed a set similar to this one.

Continental Code.

A	. —
B	— . . .
C	— . — . .
D	— . . .
E	. . . .
F	. . . .
G	— . . .
H	. . . .
I	. . . .
J	— . — . — .
K	— . . .
L	. . . .
M	— . . .
N	— . . .
O	— . . .
P	. . . .
Q	— . . .
R	. . . .
S	. . . .
T	— . . .
U	. . . .
V	. . . .
W	. . . .
X	. . . .
Y	. . . .
Z	. . . .
1	. . . .
2	. . . .
3	. . . .
4	. . . .
5	. . . .
6	. . . .
7	. . . .
8	. . . .
9	. . . .
0	. . . .
Period	. . . .



Sending Coils.

INTRODUCTORY INDUSTRIAL COURSES

R. H. Rodgers, Stout Institute, Menomonie, Wis.



At present Stout Institute, in co-operation with the public schools of Menomonie, Wisconsin, is carrying on experimental work in short-unit, introductory industrial courses. The present stage in the development of the work is the result of one and a half years of trial and, while definite statistical data is not yet available, it is known that it is fulfilling its specific purpose.

Purpose of Courses—The purpose of the introductory industrial courses is to acquaint the pupil with a large number of industrial occupations at a rather early period in his life. This introduction acquaints him in a general way with the tools, materials, processes, operations, allied technical information and vocational information of each of the several occupations. No effort is made to develop journeyman standards or to produce large amounts of commercial product, hence a capable teacher can effectively handle a group of these subjects. The completion of a number of these courses enables a boy to wisely select in the industrial field if his life's work is to be in industry.

General Organization of Courses—The courses are given to Seventh and Eighth-grade and First and Second-Year High School boys. Each year is divided into four quarters and each grade into four sections, which meet daily for two hours.

Under the above organization each grade takes the following subjects for periods of nine weeks:

Seventh Grade	Third and Fourth-Year High
Carpentry	School Electives
Plumbing	Bricklaying
Eighth Grade	Architectural Drawing
Printing	
Cabinetmaking	Forging
First-Year High School	Mechanical Drawing
Painting	
Woodturning	Joinery
Second-Year High School	Freehand Sketching
Machine Drawing	
Patternmaking	Foundry
	Machinshop

In the four-year period every boy has participated and gained some experience in sixteen distinct lines of work. During the last two years of High School he is permitted to elect from eight of the enumerated subjects, the course for which he is best adapted, and is encouraged to pursue it for the remaining two years. The work during this period is intensely vocational and every effort is made to make the student a highly skilled mechanic. This organization appears very rigid but at the same time provision is made for the boy who must drop out, by making earlier specialization possible if the individual case demands it.

Organization of Individual Courses—The organization of each one of the sixteen short-unit courses is

on a three-fold basis; first, projects or problems which are typical of the best commercial practice involving recognized tool processes and operations; second, closely related technical information covering materials, their manufacture, mathematics, construction and design; third, the vocational information which is very important and includes the importance of the trade, how entered, conditions of employment, hygiene of the occupation, demand for labor, qualifications for the successful worker, opportunities offered by the trade and numerous other topics of a similar nature. The technical and vocational information and demonstrations are so planned that they will take approximately 20 per cent of the daily class period.

To present more clearly how the organization is effectively used, courses in printing and forging typical of all the courses are submitted. The work in all cases covers a nine weeks' period of ninety hours and thruout this time all three phases of the general scheme are closely followed.

*Printing Course—Eighth Grade.

The projects and problems upon which each boy works are not submitted. Each student during the nine weeks is carefully routed thru the shop so that he gains some experience in composition, stone work, press work, proof reading, distributing and the other processes typical of the print shop. The work itself is partly of a commercial or semi-commercial nature. The outline which follows gives the related technical and vocational information which the student receives daily in the form of demonstrations, explanations or lectures.

First Week.

Monday	Lower news case. Make drawing or fill in a card showing location of type in the case.
Tuesday	Handling type. Method of picking from case; holding stick in left hand; placing type in stick.
Wednesday	Setting type. Spacing lines; justifying; dumping stick; tying composition.
Thursday	Cap news case. Make drawing or fill in card.
Friday	Importance of printing industry. Statistics; comparisons with other industries as to number of workers, capital invested, output, etc.

Second Week.

Monday	Tools and materials. Names of printer's tools and materials with which he works.
Tuesday	Terms and definitions. Explanation of the technical printing terms; special definitions dictated.
Wednesday	Proof marks. List of common proof marks.
Thursday	Reading and marking proofs. Pulling a proof on stone or in galley; reading and marking errors with the marks learned the day before.

* Outlined by C. E. Eslinger.

Friday	Physical, mental and moral requirements in the printing trade.
Third Week.	
Monday	Correcting type matter. Position in galley; wetting; making corrections in the stick; in galley.
Tuesday	Distributing type matter. Wetting; holding in left hand; dropping in case with right hand.
Wednesday	Locking in the chase. Position of type; arrangement of furniture; use of quoins.
Thursday	Job press. Naming parts of press; oiling; inking; washing the disk and rollers.
Friday	Demands for services of printers. Labor conditions; organizations; hours and wages.
Fourth Week.	
Monday	Making ready on the job press. Blanketing; make ready sheet; draw sheet; over-lay; underlay.
Tuesday	Point system. History; standard; unit.
Wednesday	Point set, point body, point lining system. Explanation of terms; illustrations.
Thursday	Kinds of printing inks. Ingredients; manufacture; use.
Friday	Working conditions of printers. Heating; lighting; ventilation; hygienic conditions.
Fifth Week.	
Monday	Mathematics of paper-cutting. Method of finding number of pieces.
Tuesday	Use of paper cutter. Demonstration; parts of cutter.
Wednesday	Kinds of job cases. California; Yankee; job cap.
Thursday	Body type and job type. Differences in size and appearance.
Friday	Education offered by the printing trade. Special schools in Indianapolis, Rogersville, Pittsburgh; apprentice schools.
Sixth Week.	
Monday	Kinds of job type. Upright; italic, script, text, Gothic.
Tuesday	Kinds of job type. Shape of faces.
Wednesday	Kinds of job type. Design of face; width of line; amount of color.
Thursday	Kinds of job type. Series; family; characteristics of type in our shop.
Friday	Advertising and journalism as field of advancement for the printer.
Seventh Week.	
Monday	Mathematics; point system.
Tuesday	Kinds of job type. Series; family; characteristics of type in our shop.
Wednesday	Kinds of job type. Sorting type from pi box.
Thursday	Display problems. Book labels; mottoes.
Friday	Typesetting by machinery.
Eighth Week.	
Monday	Mathematics of type on the page.
Tuesday	Sheetwise forms.
Wednesday	Work and turn forms.
Thursday	Use of beveled furniture.
Friday	Manufacture of paper.
Ninth Week.	
Monday	Cost of stock for jobs involving folded sections.
Tuesday	Photo-engraving.
Wednesday	Electrotyping and stereotyping.
Thursday	Examination.
Vocational emphasis.	
Friday	Review of course. Re-emphasizing the principal points of the work.

***Forging Course—Eighth Grade.**

The organization of this course is somewhat different from the preceding one, in that the projects

and problems are definitely incorporated in the outlined work.

First Week.

Purpose—General acquaintance with shop, tools and equipment; familiarity with building and care of fire; method of using common forge tools such as tongs, hammer, anvil, and hardie; elementary practice and instruction in drawing of iron.

Monday	General directions concerning character of course; regularity of attendance; class conduct; shop dress. Demonstration—building of a blacksmith fire.
Tuesday	Review of demonstration one; care of shop. Demonstration—drawing exercise.
Wednesday	Review of demonstration two. Demonstration—cutting stock to length on hardie, squaring ends.
Thursday	Review of demonstration three. Demonstration—use of flatter to finish stock; blacking with oily waste; stamping forge number on finished piece.
Friday	Talk on forge coal. Kinds; sources; tests for quality; preparation for use.

Second Week.

Purpose—Practice in handling fire and common forge tools. Elementary instruction and practice in bending and drawing problems—bent ring and staple; shop mathematics.

Monday	Calculation of stock for rings. Demonstration—bent ring.
Tuesday	Review and further demonstration of calculation of stock and making of ring.
Wednesday	Checking up shop faults. Care of fire; use of tools; position at anvil and forge; water and coal; shop discipline; care of shop.
Thursday	Calculation of stock for staple. Demonstration—staple.
Friday	Recitation on building and care of fire, coal and its preparation, use of tools.

Third Week.

Purpose—Combination of drawing and bending with new process of twisting; problem—gate hook.

Monday	Demonstration on gate hook—drawing stock; squaring; bending eye.
Tuesday	Review of previous demonstration. Demonstration—bending hook and twisting.
Wednesday	Production of iron; kinds of ore; methods of mining. Review of previous demonstration.
Thursday	Reduction of ore; production of wrought iron.
Friday	Recitation on the work of the week.

Fourth Week.

Purpose—Practice in drawing and bending; problem—hook. Vocational information pertaining to the work of the blacksmith.

Monday	Demonstration of the hook.
Tuesday	Review of previous demonstration. Comparison of iron, soft steel and cast iron. Appearance; properties; uses.
Wednesday	Talk on the importance of trade of the blacksmith in relation to numbers engaged.
Thursday	Talk on the necessary technical and trade requirements for success; age period of productivity.
Friday	Review of difficulties arising during the week.

Fifth Week.

Purpose—Factors to be considered in welding—familiarity with welding heat; problem—welding exercise.

Monday	Building of welding fire. Demonstration—welding exercise.
Tuesday	Factors to be considered in welding.
Wednesday	Welding heats and use of flux.
Thursday	Welding with gases.
Friday	Review of work covered during the week.

Sixth Week.

Purpose—Continued work in welding bringing in processes of upsetting, bending and scarfing; problem—welded ring.

Monday	Calculation of stock for ring, method of scarfing, upsetting and welding. Demonstration—welded ring.
Tuesday	Review of previous demonstration.

* Outlined by R. F. Jarvis.

Wednesday Methods of preparation for welding.
Swarf weld; butt weld; split weld.
Thursday Some historical aspects of blacksmithing.
Friday Recitation on week's work.

Seventh Week.

Purpose—Continued practice in welding involving upsetting, scarfing and bending; problem—welded washer.

Monday Calculation of stock, scarfing and welding. Demonstration—welded washer.
Tuesday Review of previous demonstration.
Wednesday Prevention of accidents in forge shop.
Thursday Economic conditions and wages of blacksmith; profit to owner.
Friday Recitation on work of the week.

Eighth Week.

Purpose—Continued practice in welding, scarfing and twisting; problem—stove poker with twisted handle.

Monday Demonstration—twisting and welding handle.
Tuesday Demonstration—welding handle on poker.
Wednesday Relation of design to forging work.
Thursday Hygienic conditions surrounding the blacksmith; health; age period of productivity.
Friday Recitation on work of the week.

Ninth Week.

Purpose—Elementary principles of forging, hardening and tempering of steel.

Monday Demonstration of forging of chisel.
Tuesday Demonstration of tempering of chisel.
Wednesday Uses of tool steel and methods of tempering.
Thursday Requirements for success as a blacksmith.
Friday Completion of work, cleaning and straightening of shop.

Vocational Record—Since the prime purpose of these numerous courses is to introduce the boy to as many of the different lines of work as possible, it is necessary that an accurate record be kept of his aptitudes, interests and attainments as he moves along from subject to subject. A very simple card to supplement the regular school records was devised to cover one year of work. The blank record which follows indicates clearly its character.

VOCATIONAL RECORD.

Name		Grade	Year
Subject	Rank	Remarks	

Note: Under remarks consider interest, aptitude for the work, mechanical insight, quickness, etc.

Suggestions for the Development of the Work—

Every school system has more or less marked characteristics, hence the suggestions must be general. First, any community employing two industrial teachers may by careful scheduling, give eight of the short-unit courses as described. Second, part-time teachers from the trades may be used to handle several of the courses. Third, towns and cities in close proximity may co-operate in securing the services of special teachers, who would spend a certain definite time each week in the several communities.

Conclusions—The organization of introductory industrial courses on the basis presented is effective, in that it aids students in determining their future occupations. Further, it is practical from the administrative standpoint since efficient instructors can teach these various groups of subjects.

IT is the mission of the United States to ennoble toil and honor the toiler. In other lands, to labor has been considered the lot of serfs and peasants; to gather the fruits and consume them in luxury and war, the business of the great. Since the mediæval times, European society has been organized on the basis of a nobility and a people. * * * Thus has been set on human industry the stigma of perpetual disgrace. Something of this has been transmitted to the new civilization in the West—a certain disposition to renew the old order of lord and laborer. Let the odious distinction perish, the true lord is the laborer and the true laborer the lord. It is the genius of American institutions, in the fullness of time, to wipe the last opprobrious stain from the brow of toil and to crown the toiler with the dignity, luster and honor of a full and perfect manhood.—*John Clark Ridpath.*

The Making of a Book for the Indiana Centennial as a Problem for Team Work in Applied Arts

Miss Myrtle Gillispie, School 52, Indianapolis



FOR a number of years the Making of a Book has been a part of the Course in Art for two Eighth Grades in the Indianapolis Schools. These books are to be put to any use that the teacher or teachers of any building may deem most suitable for the general work at that time.

At School Number 52—one of the semi-industrial centers of the city—we have always seized upon these books as an excellent problem for true team work. The results have been beyond our expectations; for each year we find new possibilities for the work of each department in our school, both academic and manual.

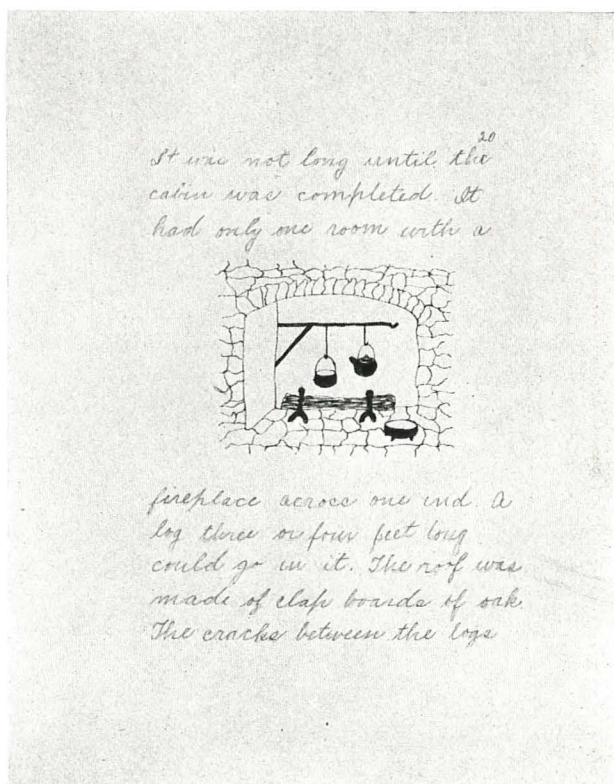
The benefits derived by the pupils from making these books has been incalculable. They have always been a source of much interest on the part of each pupil, even to the extent of using much extra time in research or in enriching the book either in thought or beauty. From these, each pupil has always received a vast fund of information, and the quality of his work has been increased to a higher standard along all kinds of activity in his schoolwork.

During the past years we have always made the History of some Industry as the theme for these books, and the work upon them continues thruout the entire school year.

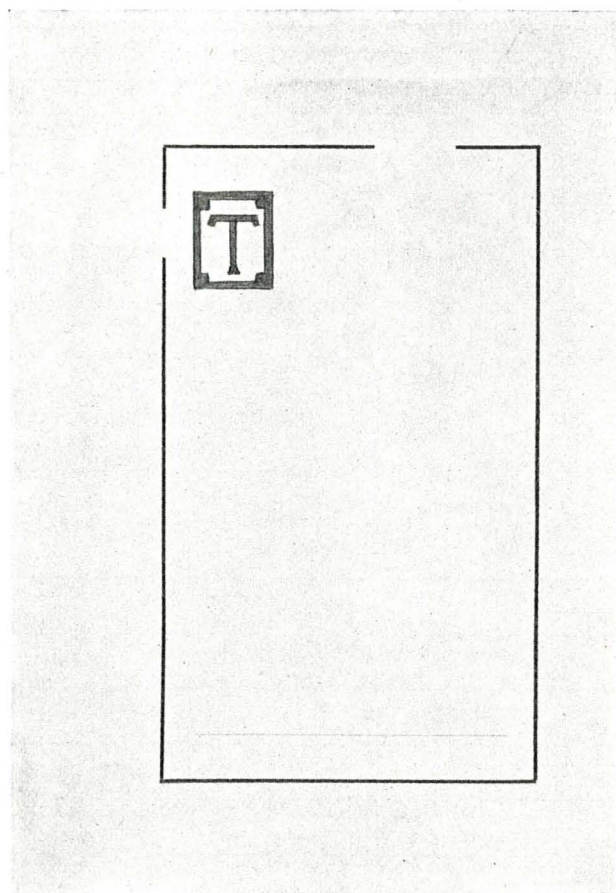
The following are some of the subjects: A Book About Saws, Story of Iron, Story of Wood, Woodcraft, Needlecraft, From Cotton to Garment, From Wool to Garment, Architecture, The Home, Book About Books, Booklore, and now the theme is Our Indianians.

This is the Centennial Year for the State of Indiana, consequently her schools are laying much stress upon the State and local history. Since history in some form or other has always been our theme for book-making, it is logical that some phase of Indiana History should be the theme for our books this year. We also decided that it would be a good scheme to have the teacher of each department help us not only vitalize but visualize this centennial work; for the true aim of teaching Indiana History is simply to give the Hoosier boy or girl an opportunity to find himself in his relation to the past and future. It is the purpose of this article to present the main points in our plan for this year; for we have enlarged on the scheme of former years.

1. In the *first place*, we realized that we must discover a basis for studying Indiana History in order that we might have a unity permeating the whole book from cover to cover. We hope thus to



Leaves from Handmade Book showing the sketching done by the pupil, and the placing of same with margin.



Design for Initial Letter of Poem.

have a finished product in the end, which will be an appropriate offering to this State on her One Hundredth Anniversary.

The *theme* that we are using is "Our Indianians." We decided to treat Indiana History from its biographical standpoint, because pupils cannot read, think, talk or write of the discoverers of our country, explorers of its waters and plains, of the patriots who established our free and independent government, without being inspired by their trials and heroisms in developing this wonderful State.

2. In the *second place*, the subject material for the content of the book is being discussed in all the departments of our school by the teacher of that particular subject, and by the pupils in those classes. This gives the history from the viewpoint of each particular department. You will note these points in the following outline:

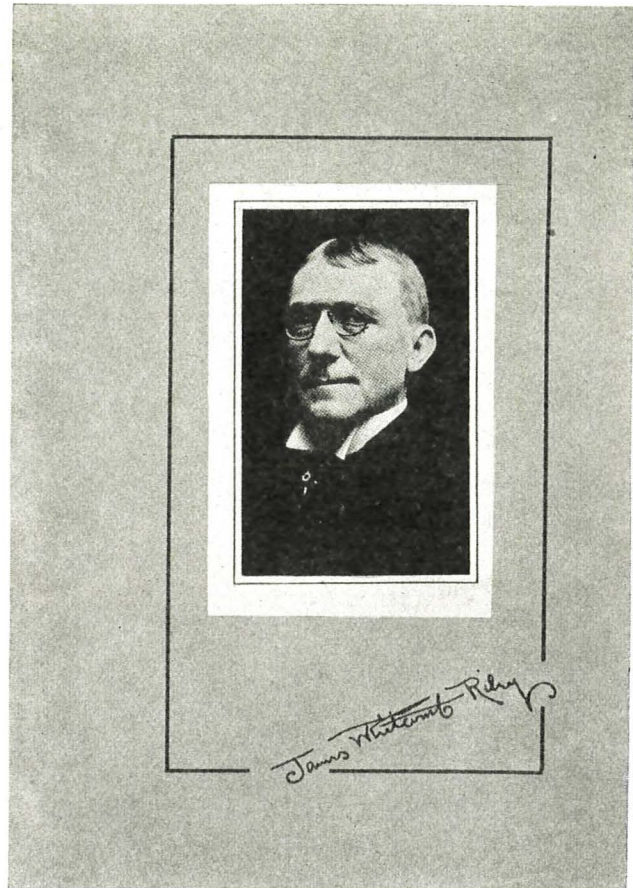
Outline for the Biographical Study of Indiana in Various Departments.

Past and Present.

Subject	Department
INDIANA WOMEN:	
Clothing Clothiers Handicraft	Domestic Art
Dyers Spinners Weavers Potters Etc.	Special Handiwork
Cooks Foods Utensils	Domestic Science
INDIANA MEN:	
Journalists	Printing
Foresters Architects Furniture Mfrs. Vehicle Implement Gary Plant	Woodworking
Musicians	Music
Artists	Arts
Writers	
Poets Dramatists Novelists Etc.	English
Mathematicians Civil Engineers Surveyors	Mathematics
Geographical Points, Maps, Etc.	Geography
Historians Statesmen Explorers	History and Civics

3. *Thirdly*—It is hard to single out those men who should be ranked among the greatest men of Indiana for it has had many; yet the lives of so many of them have had so much to do with the shaping of the destinies of the State, and giving character and tone to its history, that to know their lives and the times thru which they lived, gives us a complete history of our State.

The following men have been selected:



A Page of Printed Book Dedicated to Riley.

Prominent Men to be Emphasized.

Early Exploration and Colonization—LaSalle, Father Hennepin, George Rogers Clark, Tecumseh, Little Turtle, Wm. Henry Harrison.
 Horticulturist—Johnny Appleseed.
 Reformer—Robert Dale Owen.
 Geologists—David and Richard Owen.
 Inventors—Richard Gatling, James Eads (Civil Engineer).
 The Pioneer—Lincoln.
 Poetess—Sarah T. Bolton.
 Soldier and Novelist—Lew Wallace.
 Historians—Benjamin Parker, John Ridpath, John Dillon, Jacob Dunn.
 Authors—Maurice Thompson, Edward Eggleston, Meredith Nicholson, Booth Tarkington, Gene Stratton Porter, George Ade.
 Scientist—Harvey Wiley (Pure Foods).
 Statesmen—Jonathan Jennings, Benjamin Harrison, Oliver Morton, Turpie, Robt. Owen, Colfax, Fairbanks, Beveridge.
 Educators—Caleb Mills, Barnabas Hobbs, David Starr Jordan (Peace Advocate), Wm. McClure and Robt. Owen (Smart and Wylie).
 The Hoosier—James Whitcomb Riley.
 Artists—Jacob Cox (Father of Art), Wm. Chase (Most Distinguished), Steele, Forsythe, Stark, Adams, Gruelle, Reiss.



Poem Printed and Mounted.

A Mounted Picture of Pioneer Life.

A Mounted Poem With Block Printed Decorations.

Captains of Industry—Studebakers (Vehicles), James Oliver (Plow), Chauncey Rose, Washington DePauw (Philanthropic), Hugh McCulloch (Banker).

4. In the *fourth place*—All grades from the Sixth thru the Eighth grade are participating in making this book. This is done because the subject is one that belongs to every pupil, to every class and to every grade. By so doing, we believe that we have a plan of a character that is arousing every pupil to the past and is provoking a civic helpfulness for the present and future of our commonwealth. All this is being brought about because we have the co-operative effort of an entire building—275—to this one big problem, namely the Indiana Centennial Book.

5. In the *fifth place*, we are making and will have three classes of books at the close of the school year.

(a) *Loose-leaf book*.

1. This form of book is being used by the pupils of the *sixth* and *seventh grade*, as it is much simpler

and we desire them to give more time to the thought than to book forms.

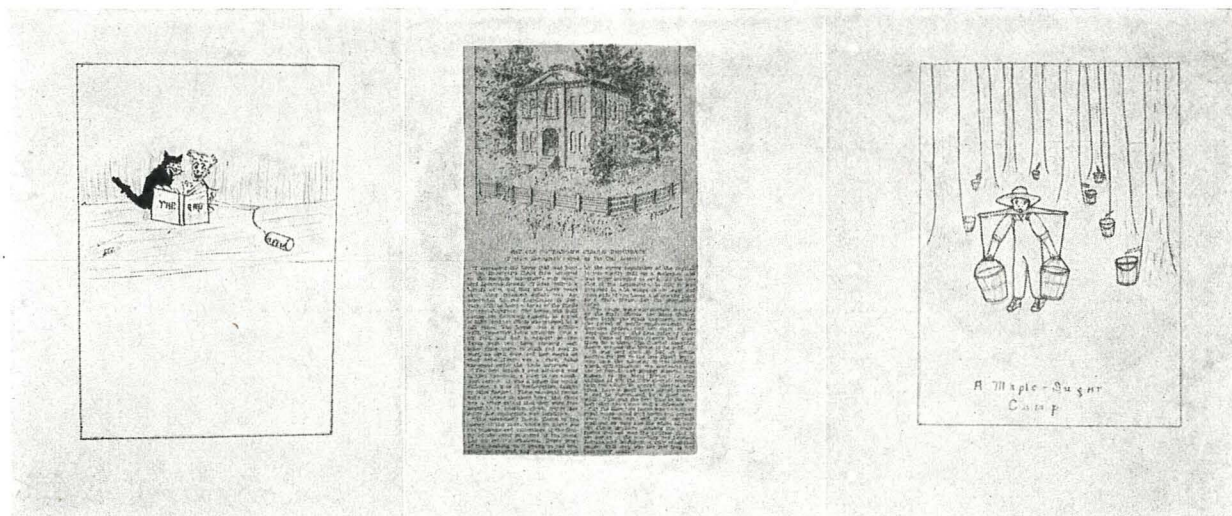
2. The *backs* for these will be made in the Art Department. The form is one of those simple backs, not very durable, but sufficient to preserve the pages of the pupil's compositions, mountings, etc., all of which are fastened between the flaps of the cover with flat head brass fasteners.

3. The *title* of the book will be simply printed by the boys in the Printing Department.

4. Each composition written by the student is being placed in his own individual book with some attention given to outer and binding margins.

5. All newspaper clippings and pictures collected by each child are being mounted on paper and placed in same. Their observation grows keener as the weeks pass by.

6. Any poems printed by the printing classes pertaining to our subject are distributed to each pupil for his book.



An Original Tail Piece.

A Historical Clipping Mounted for Book.

A Full Page Sketch.

(b) *Individual handmade book.*

These are being made by all Eighth-Grade pupils as in former years, but the theme is "Our Indianians." These are made entirely by hand and the book may become as artistic, interesting and instructive as the pupil is able to make it. More will be explained about these, later in this article. The central figure in the illustration shows a finished book while the others are merely book covers.

(c) *Printed book.* This printed book is, in a sense, a culmination of all the other work, and is in the process of making thruout the year.

1. The best compositions that are written in each grade are being set up and printed in the Printing Room.

2. The best designs for the cover, title page, tail pieces, initials, etc., are chosen and transferred to linoleum blocks and used for this printed book.

Thus the printed book will contain next June, the material which has been the result of spirited competition by all the pupils, in all the classes upon all these men whom we selected.

Suggestive Plans for Cooperative Work in Making a Book on (Any Subject).

(We shall use the subject we are studying as more specific).

1. Art Department. This is the department which especially contributes to the success of the book. The following points can be covered here:

1. Design for the Cover.

(a) *Printed Title.* This is the simplest method of treating the cover, so it is the method best for constructing the loose-leaf books as we are doing for sixth and seventh year.

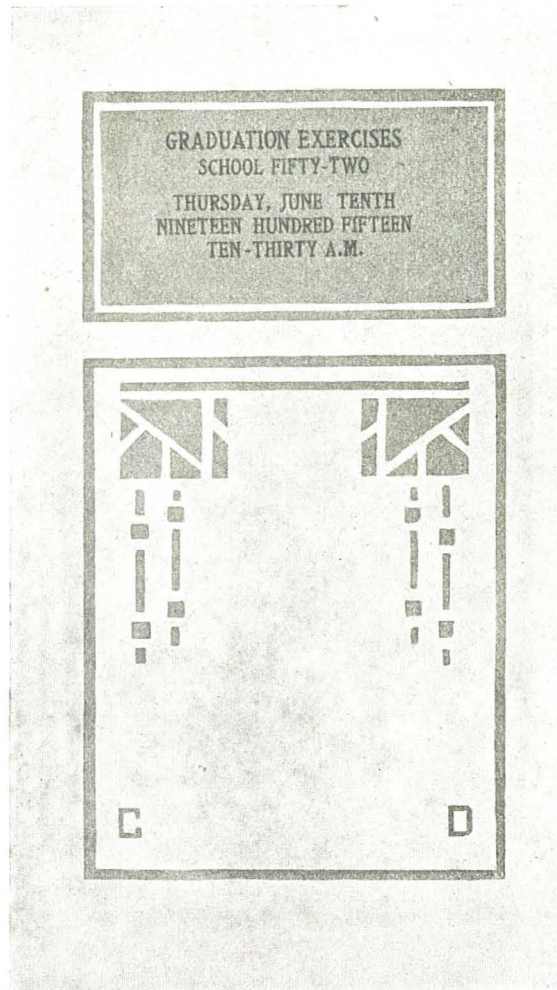
(b) *Silhouette.* This scheme lends itself very easily as a decorative spot and is easily transferred to a linoleum block for printing. One such may be seen in the group of bookbacks which are shown in the illustration.

(c) In the *handmade* books a great variety of suggestive spots were used by our pupils.

1. Trees (Beech, Sycamore, etc.)
2. State Flower (Carnation.)
3. Indian Corn.
4. Canoes.
5. Indians.
6. House Tops.
7. The Apple.
8. Log Cabins.
9. Shield and Flag.
10. Map of State.
11. Pioneer Kettle, etc.

Each child selects his own spot and makes an individual design which he uses and paints. The lettering is also done by hand.

(d) *Linoleum Block.* For the printed book, one is more limited in the kind of design which can be cut and used on the printing press. We have



Cover made from Linoleum Block Printed.

chosen the one in the center of illustration as the one for our anniversary book.

(e) *Color Process.* The linoleum block will make it possible for one to use two colors or to use a two-tone effect.

2. The Title Page.

(a) The page should be studied as to the content.

(b) The placing of name. This printing of a child's name on the title page gives a sense of great joy to the heart of the youth.

(c) There should be a study of proper spacing.

(d) The size of the type for each part of the content can be decided upon.

3. *Dedication Page or Frontispiece.* These can be studied from a number of books, noting the various forms:

(a) By an illumined quotation.

(b) By a personal or poetic tribute.

(c) By the picture of person. We have dedicated our book to our Hoosier Poet, James Whitcomb Riley. We are printing his picture from a halftone, and are using the tribute written to him by another one of our writers, Mrs. Sarah T. Bolton. This we expect to illumine by a simple linoleum block in our printed book.

4. *Headings of Chapters.* In this connection two points only need to be discussed:

- (a) The proper spacing.
- (b) Making of initial letters. These can be used here or only at the beginning of poems.

5. *Tail Pieces* are a decided advantage in giving a finished appearance to pages, at

- (a) Ends of chapters, or
- (b) Close of book.

These can be either handmade or made from linoleum block.

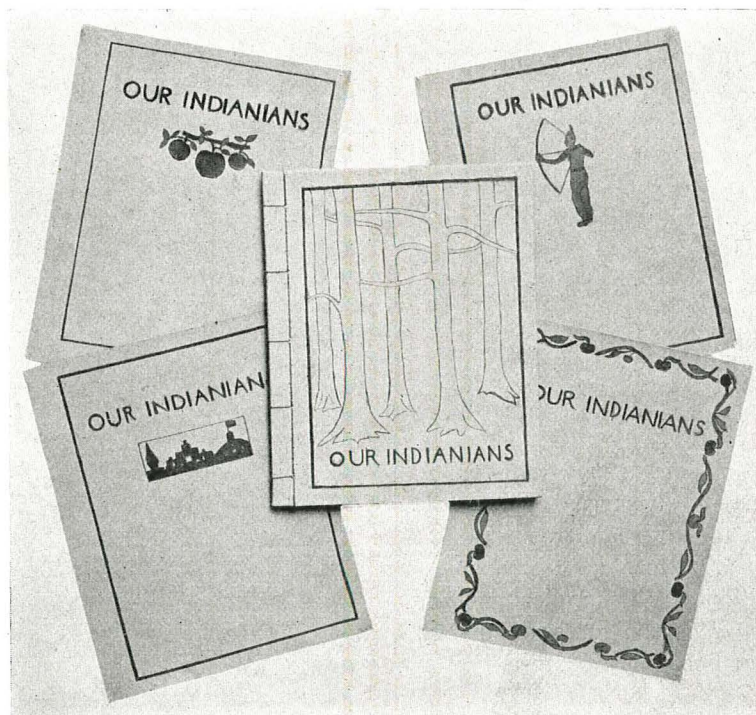
(b) From post card firms—from Underwood—from the Mentor, or any picture company.

8. *Book Plates.*

(a) Blueprint book plates may be made for individual books.

(b) A zinc plate can be made from an original design for printed book. This plate we have had made for the building.

9. *Clippings* made from magazines or newspapers can be arranged and mounted in this department.



Book Covers, Grade VIII. Designed, painted and printed by the pupils.
Center one shows a finished book.

6. *Poems.* The poems that have been previously selected in English Room can be either

- (a) Mounted if printed previously or
- (b) Illumined by initial letters or spot work.

The poems selected for Indiana have been:

"Indiana" by Sarah T. Bolton.

"Indiana" by James Whitcomb Riley.

"Right Here At Home, Boys" by James Whitcomb Riley.

"Child's Home of Long Ago" by James Whitcomb Riley.

"The Wabash" by Maurice Thompson.

"Town of O'Tail Holt" by James Whitcomb Riley.

"Hoosier Nest" by John Finley.

"Pioneer's Memorial" by Meredith Nicholson.

7. The Art Room may look after the selecting of the pictures and mounting the same. (This of course pertains to handmade book only.) These pictures can be obtained from

- (a) Newspapers and magazines.

10. After all these foregoing things have been done and the book is compiled, the book is to be *bound*. This can be done

- (a) By sewing as the one in illustration.
- (b) By stapling if you own such a machine.
- (c) By punching and tying.

11. *Printing Department.* There is such a close relation between Art and Printing that there is no dividing line; for there is Art in Printing and Printing in Art. The making of a book demonstrates this to a pupil as he progresses in this work.

1. The following *material* may be printed according to the time allowed for this work:

- (a) The title page at least ought to be printed.
- (b) Poems may be printed and distributed.
- (c) Compositions are being selected from each grade.

2. The linoleum blocks designed in Art Room are cut here. They are as follows:

- (a) Design for cover.

- (b) Illuminated quotations.
- (c) Tail pieces.
- (d) Initial letters for chapter headings or poems.

III. *English Department.*

1. All subject material for the book is organized and composed. This can be done orally and followed by written form.

Criticisms have sometimes been made by saying that history does not offer enough variety in forms of composition; but, we contend that all types of expression can be used,—description, narration, exposition argumentation and letter writing, as

- (a) "An expedition with La Salle."
- (b) "Priscilla writes a letter to a New England cousin, telling about her work as a pioneer in Indiana."
- (c) "How little Sarah Lincoln made hoe cake."
- (d) "An argument between the *Gatling Gun* and an Iron Clad Boat of Eads."

2. In the second place, there is a constant study of book forms, as to

(a) *Margins.* These are best kept uniform in the handmade book by the use of a template. We use one with upper margin of $1\frac{1}{2}$ ", inner margin $1\frac{7}{8}$ ", bottom $1\frac{3}{4}$ ", and outer $1\frac{3}{8}$ ".

- (b) Chapter Headings.
- (c) Table of Contents.
- (d) Paging the book.

These points, studied by the pupils, develop a greater care on their part, for they soon recognize the beauty of neatness, accuracy and uniformity.

3. The final compilation of the book belongs in the English Room; then it is to be paged.

4. There is much opportunity for *word drills* for spelling in these various exercises.

IV. *Reading Department.*

1. There is much industrial reading which can be done silently or orally.

2. Much reference and research work is carried along. This often teaches the value of the library as nothing else has done.

3. The material may be cataloged for future reference.

V. *History Department.* The History of Indiana is being taught by all teachers in all departments, as pointed out in outline, but with our particular subject this year "Our Indianians," the history classroom gives much valuable help in our project. Here as well as elsewhere, there is a study and discussion of men and women as they had to do with the affairs during the period of their life; thus a pride in every Hoosier boy and girl should be aroused as to achievements of their ancestors and their companions today. Certain it is that we can well afford in 1916 to give the pupils a backward look, frankly acknowledge the mistakes of the past; but let them receive inspiration from the good achieved thru the lives of our State's noble men and women, and set their faces resolutely forward to a bigger and better future.

Whatever we do this year in a material, or spectacular way, in teaching one hundred years of our State's History, will soon pass away, yet we do desire that the influence of this teaching shall be abiding for years to come.

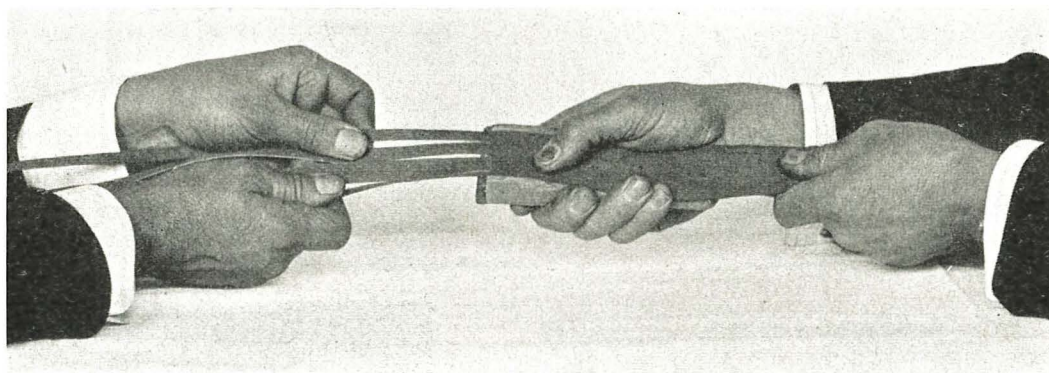


PLATE 1.

INDIAN SPLINT WORK

Edward F. Worst, Director of Elementary Manual Training and Construction Work,
Chicago, Ill.



INDIAN splints are the products of the oak and the black ash drawn in long shaving-like bands from the log with the grain of the wood. It is a material very extensively used for basketry by the various Indian tribes living in the Northern and New England States and various parts of Canada.

Of late it has been used in the manufacture of furniture in combination with various woods, much the same as willow, cane, pith cane, rushes, and hickory splints. It is a most attractive material to be used in this way, as it is inexpensive, easily handled, and easily dyed or stained to harmonize with the wood used and other furnishings of the room.

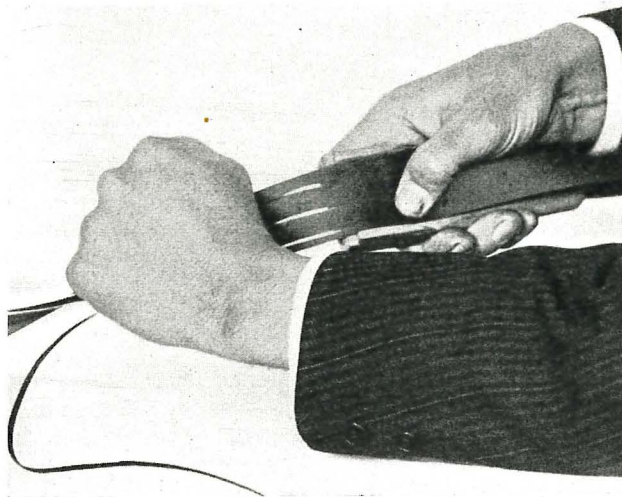


PLATE 2.

in which the finished furniture is to be placed. It has been found to stand the test of all possible conditions of climate and hard usage of the sun-beaten and frequently storm-swept piazzas, the furnace-heated living room, the wind-swept seashore, and mountain bungalows.

The splints as found in the market for basketry, trays, and furniture panelling are in long shavings varying in width from $1\frac{1}{2}$ " to 2" and often several yards long. This material is furnished in three weights—thin, medium, and heavy. In case any particular weight is desired mention should be made at the time of the purchase. Very often the three weights are found in a single coil. This is very convenient in basketry, as the three weights are used in different parts of the same basket. In the retail markets of our large cities the price has often gone as high as \$1.60 per pound, thus making the work prohibitive in our public schools. On the other hand, when purchased directly from the producer the price ranges from thirty to forty cents per pound. C. N. Saba and Company, 305 Yonge Street, Toronto, Ontario, are most reasonable in their prices on Indian splints, birchbark, and sweet grass.

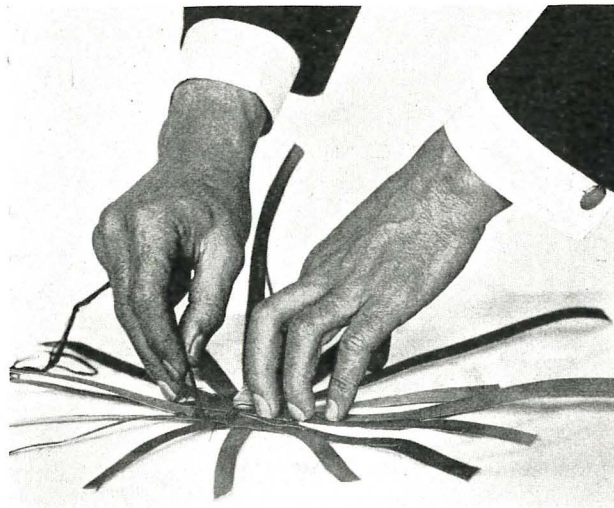


PLATE 3.

The expense of sweet grass, which is much used with the splints in basketry, makes its use in most schools prohibitive. A three-strand braid of raffia makes a good substitute. In order to make the braid continuous begin with strands of different lengths, thus allowing no two to run out at the same time. In adding a new strand the end of the old strand and the beginning of the new are braided as one. This braiding affords a most pleasing occupation for the pupils who are to construct trays and baskets, and may be pursued at home, thus providing occupation for the now many leisure hours.

Trays and Baskets.

One of the great aims of manual training is to combine judgment, a purely mental function, and execution, a purely physical one.

There seems to be no work so efficient in combining the two from the beginning, as basketry. The material varies so in texture that care and judgment are required in its manipulation, and so few tools are used that the hand must do all, or a greater part, of the work.

In all teaching the character of the work should be emphasized rather than the intrinsic value of

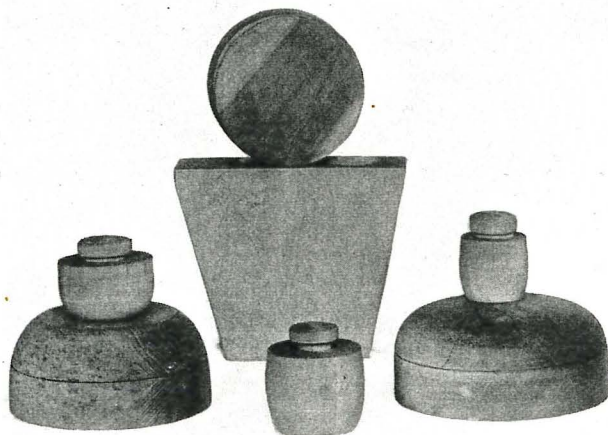


PLATE 4.

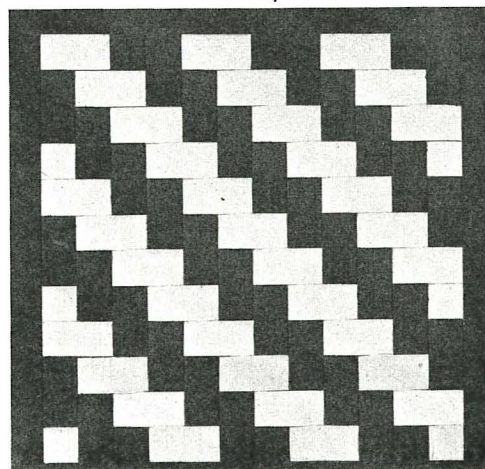


PLATE 9a.

that which is produced by work. The aim should be to have work complete in all its parts as to beauty of design and workmanship, and finished insofar as the completed work coming from the pupil can show his intention and evince careful and diligent work. The teacher should never hurry the different stages of the work faster than the pupils can go.

The Cutting Gauge.

The cutting of splints into desired widths is accomplished by the use of a gauge, as shown in Fig. 1.

The little points of steel which do the cutting are simply pieces of discarded watch springs which may be had at any watch repair shop for the asking. The little knife-like projections are filed after being placed. Each teacher should have several gauges for cutting different widths. The distance between the points determines the width of the splint. The most used splints are $\frac{1}{8}$ ", $\frac{1}{4}$ ", and $\frac{5}{8}$ " wide.

Cutting the Splints.

Press one end of the splint down upon the points, allowing enough to extend beyond the edge of the gauge to make it possible for one to pull the splint while the other holds the gauge and guides the splint, Plate 1. This may be done by one person, by holding the gauge and strip in one hand and pulling with the other, Plate 2.

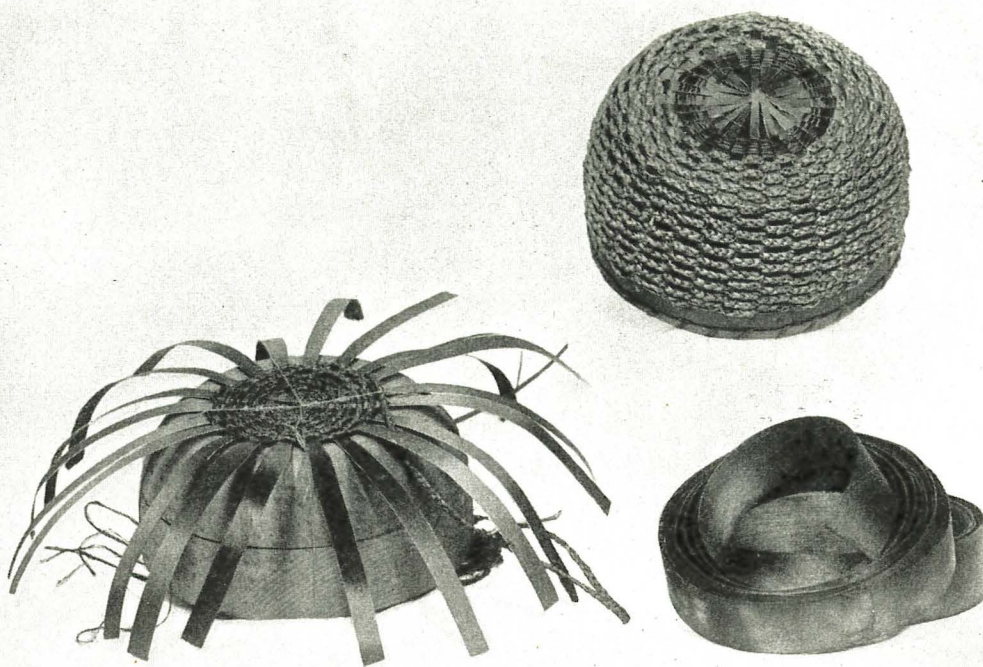


PLATE 5.

Making a Small Tray.

One of the simplest problems in the splint work is making a tray. This involves the use of braided raffia. The tray is to be 6 inches long, 4 inches wide, and about one and one-half inches deep when finished.

By using the gauge cut strips five-eighths of an inch wide. Dip the splints in water before cutting. It is not necessary to allow it to soak as in the case of reed. Cut seven strips, each ten inches long, and nine strips, each eight inches long. Lay the ten-inch strips in a horizontal position on the desk and weave the eight-inch strips across, as shown in Fig. 2. A little difficulty may be experienced in weaving in the first two strips. To aid in keeping a good shape blocks of wood are used. The block may be made of soft wood and squared up by the pupils taking shop work. Blocks of wood might

be brought in from any carpenter shop or from any new building in the process of construction. Tie the woven bottom to the block of wood, as shown in Fig. 3, allowing the ends to project. The splints, slightly moist, are bent upward around the block, as shown in Fig. 4. It is just



PLATE 6.

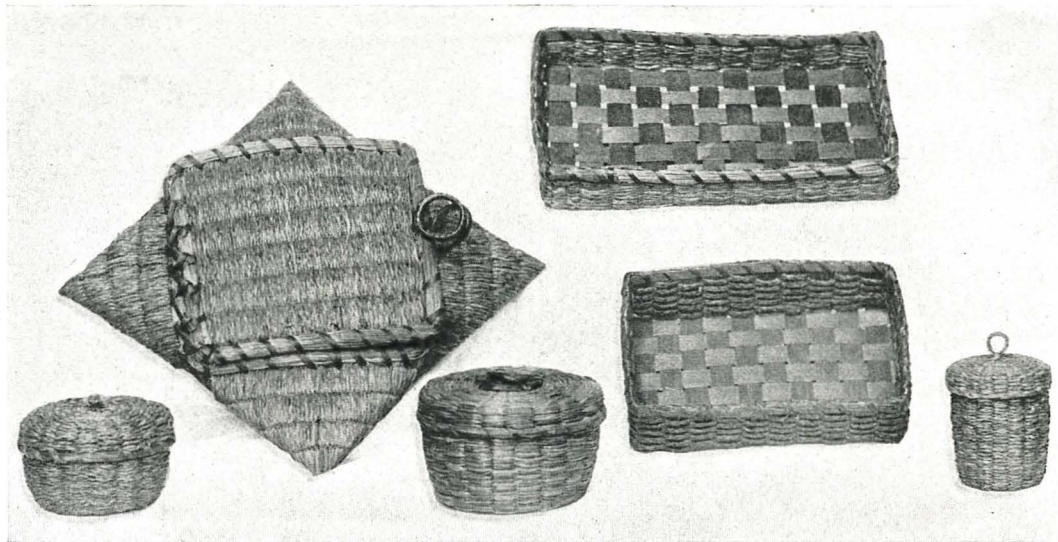


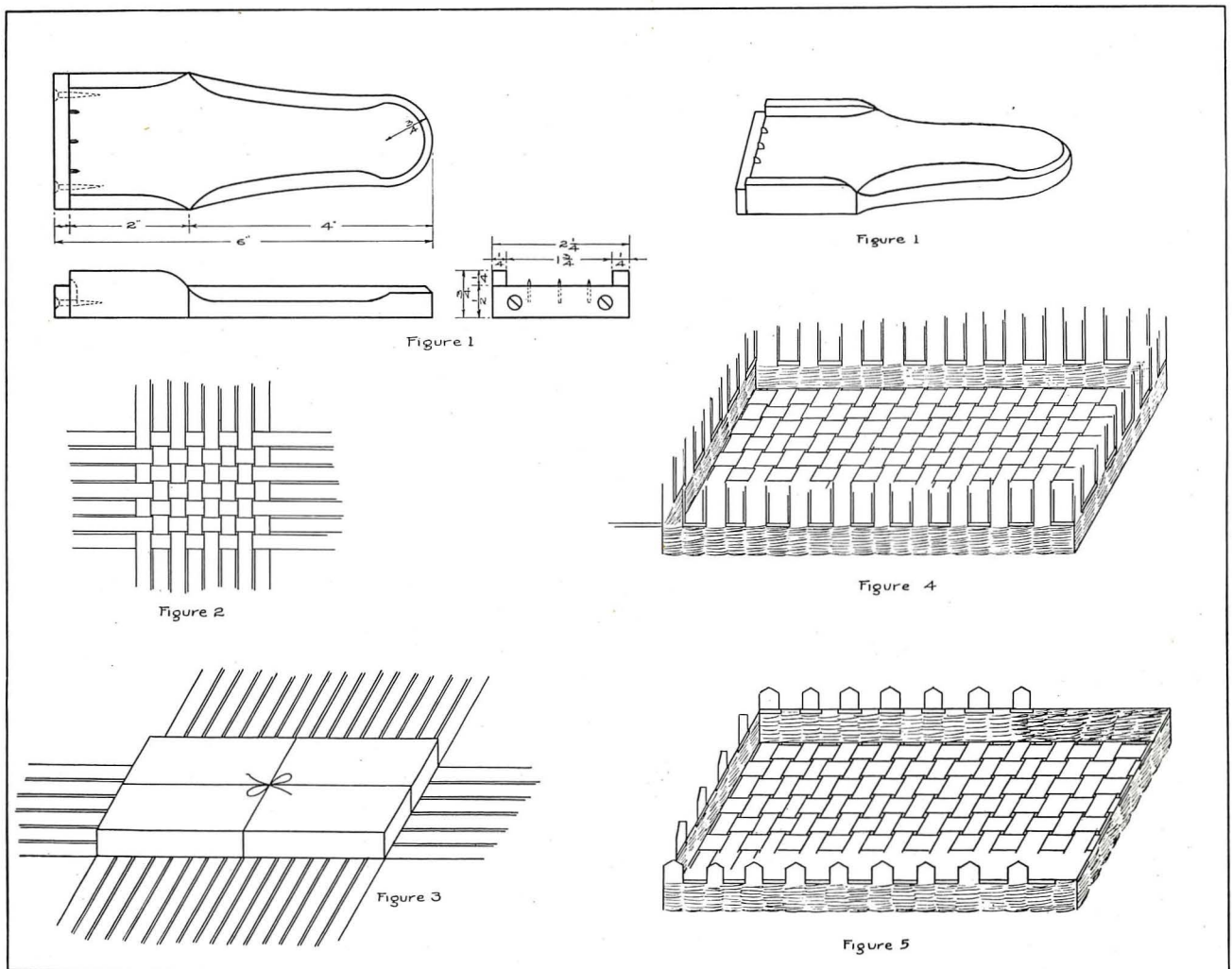
PLATE 7.

possible that the splints will be slightly cracked in the bending. This does not interfere so long as no part falls away.

C The weaving with the braided raffia is now begun, and continued until the weaving is as high as the

block is thick.

In the weaving of reed mats and baskets it was learned that in order to do continuous weaving, that is, to weave so the weaver passes under one spoke and over the next, there must be an uneven number



Working Details of Basket Weaving. Fourth, Fifth and Sixth Grades.

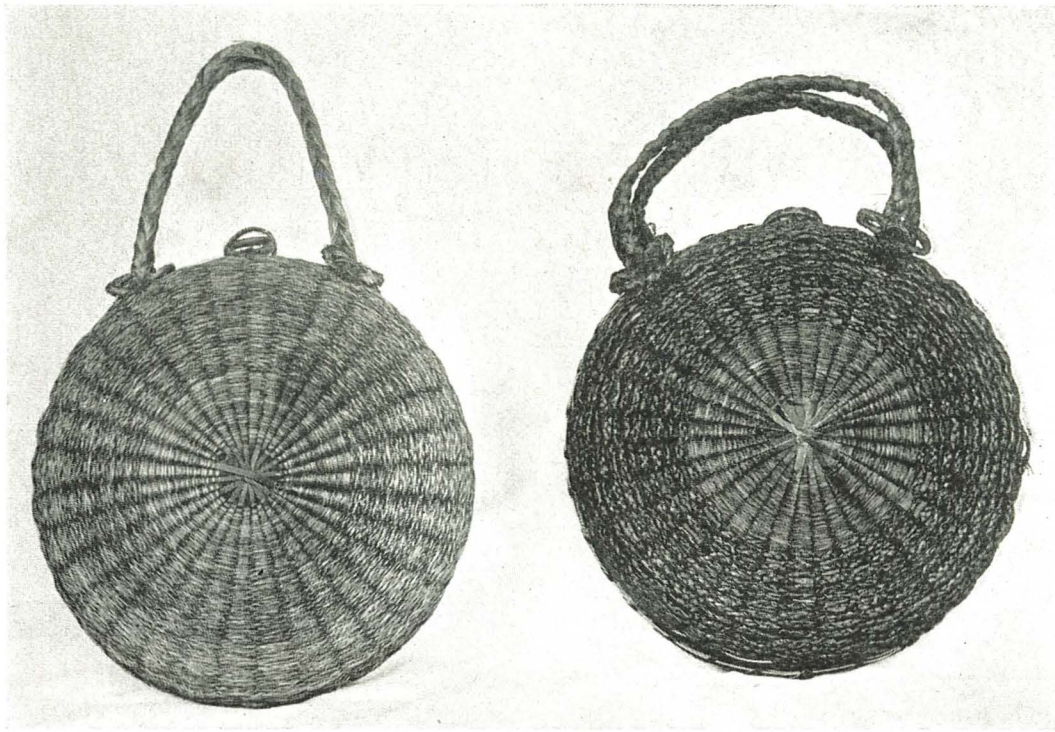


PLATE 8.

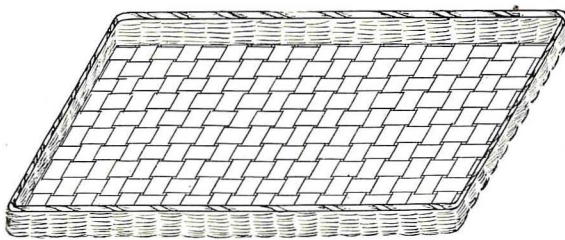


Figure 6

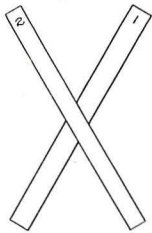


Figure 7

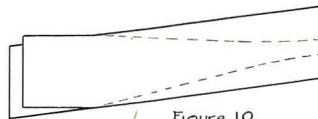


Figure 10

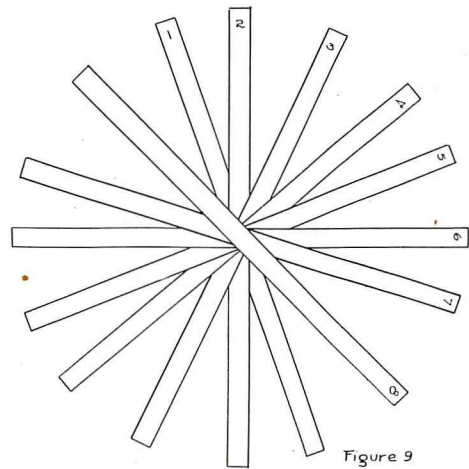


Figure 9

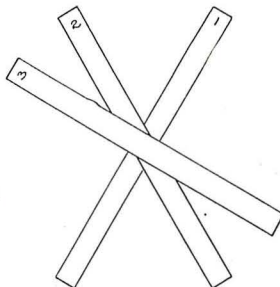


Figure 8

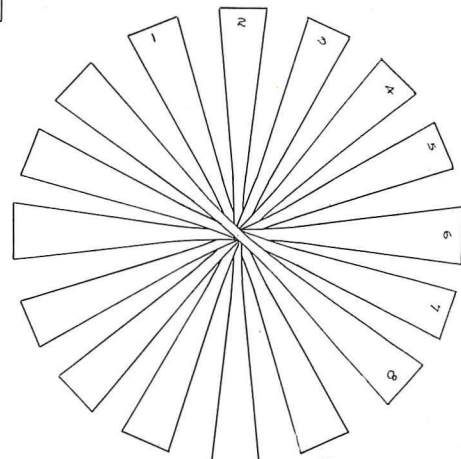


Figure 11

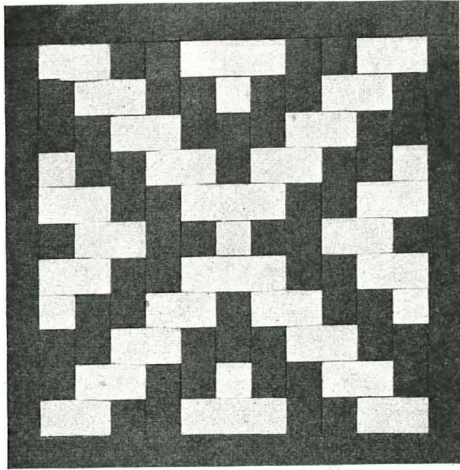


Plate 9b.

of spokes. In splint work there is an even number of spokes. Each time the weaver passes around the tray or basket a place is reached where it is necessary for the weaver to pass *under* two splints. The weaving is then continued under and over until the place is reached where it is necessary for the weaver to pass under two again. It will be observed that this happens each time around.

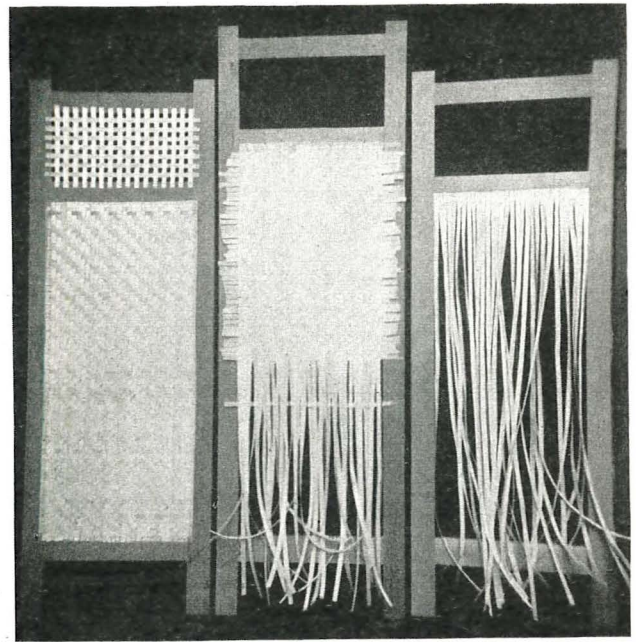


Plate 10.

When the raffia weaving is finished one strip of the splint $\frac{1}{4}$ " wide is woven around to top, as shown in Fig. 4. Allow the end of this strip to weave under

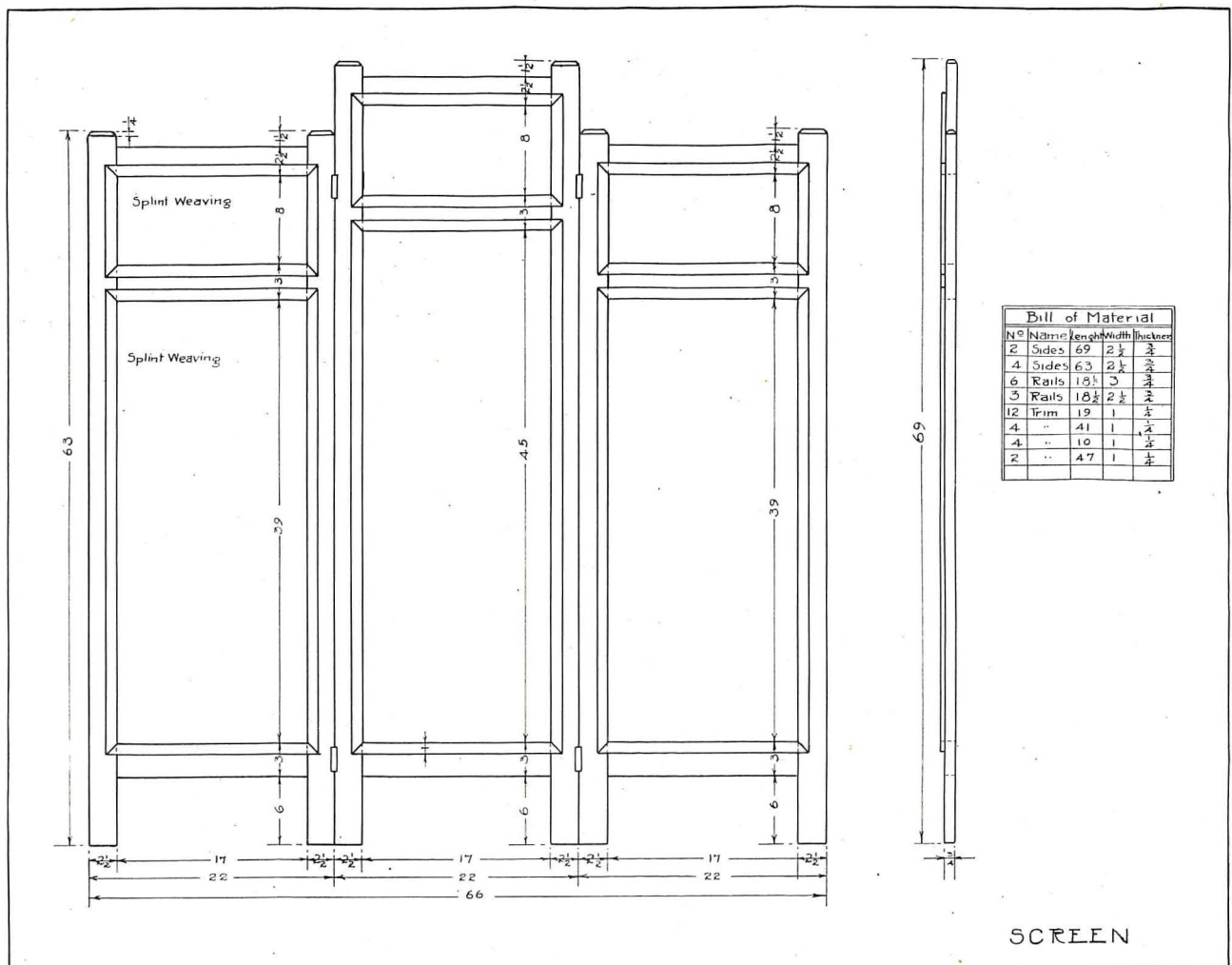
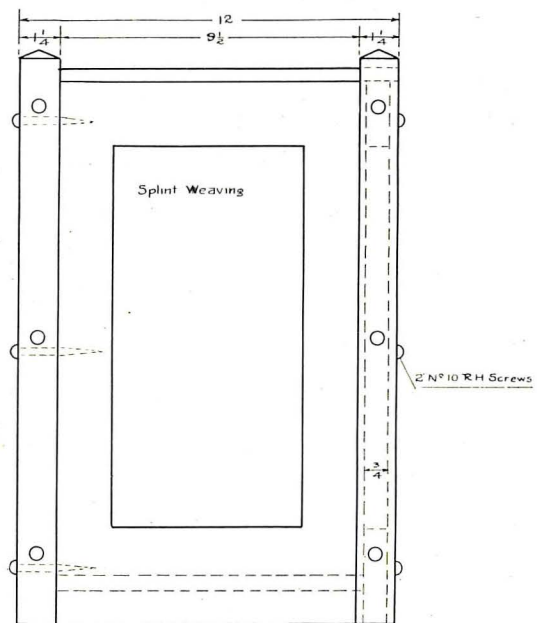
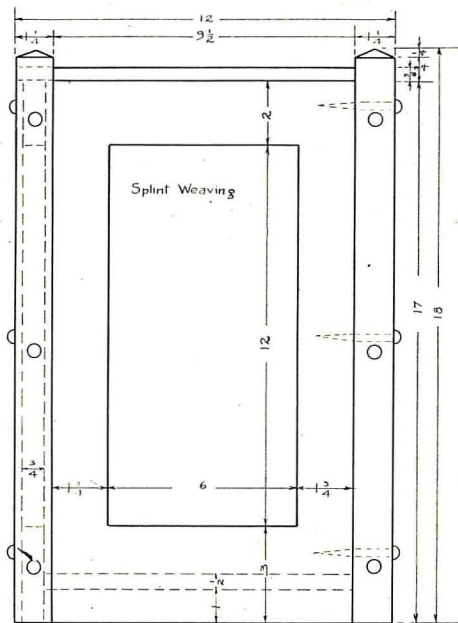
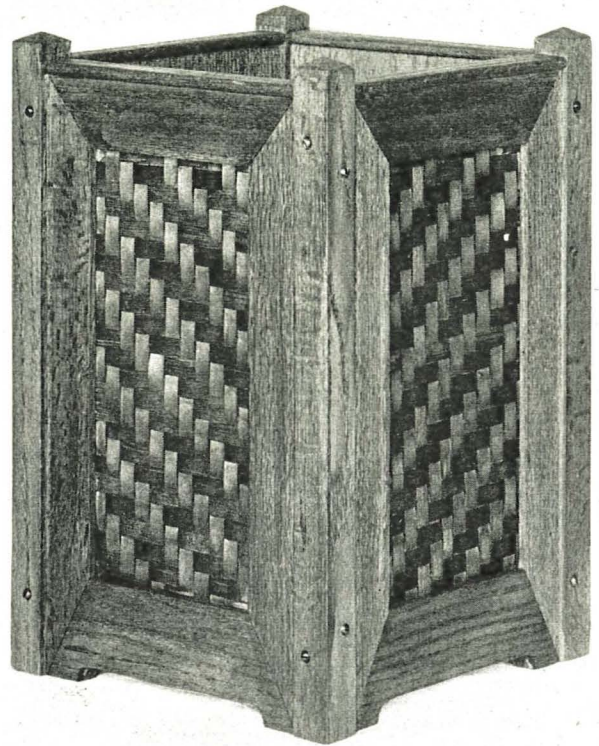


Fig. 12. Working Drawing of Screen. Eighth Grade.



Bill of Material				
Nº	Name	Length	Width	Thickness
4	Posts	18	$1\frac{1}{2}$	$1\frac{1}{2}$
4	Sides	17	$9\frac{1}{2}$	$\frac{3}{4}$
4	Trim	$9\frac{1}{2}$	$1\frac{1}{2}$	$\frac{3}{8}$
24	4x4 Slew	2'	Nº	10
1	Bottom	10	10	$\frac{1}{2}$

WASTE BASKET

SEVENTH GRADE

Fig. 13. Working Drawing of Waste Basket. Seventh Grade.



Plate 13.

and over the same spokes as the beginning. This overlapping keeps the two ends together.

Each spoke on the outside of the $\frac{1}{4}$ " strip woven around the top is cut pointed, as shown in Fig. 5, turned to the inside, and slipped under the weaving. The other spokes are cut away even with the top edge of the tray, as in Fig. 5.

To finish the top edge take another $\frac{1}{4}$ " strip of the ash and about eight strands of raffia. Place the strip of ash on the inside of the tray along top edge, the bunch of raffia to the outside, and with a darning needle threaded with raffia overcast around the top so that the raffia and splints are held in place by the overcasting, as shown in Fig. 6. The needle passes between the spokes.

The process as above described holds good in all splint work.

To Make a Small Circular Basket or Tray.

1st. With the use of the $\frac{1}{4}$ " gauge cut a number of strips.

2nd. Cut the $\frac{1}{4}$ " strips into 12-inch lengths.

3rd. To arrange the strips for weaving allow two strips to cross, as shown in Fig. 7. Lay a third strip, as shown in Fig. 8. Place the first finger of the left hand at the point where the strips cross, continue to lay the strips until all have been placed,

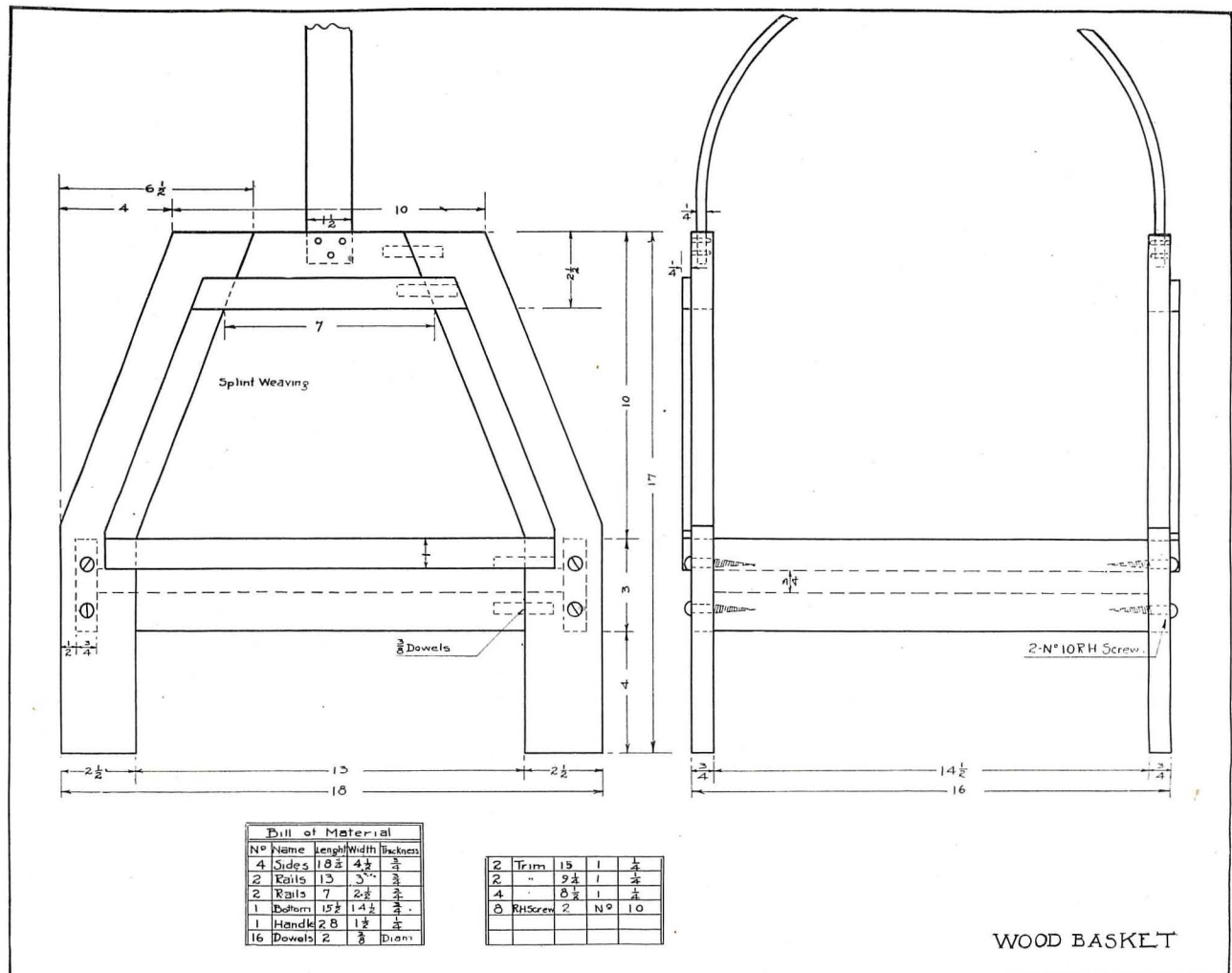
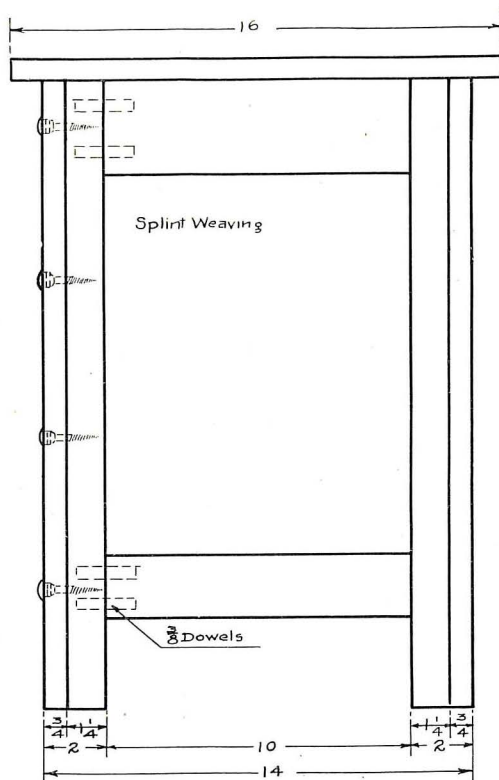


Fig. 14. Working Drawing of Wood Basket. Seventh Grade.



Bill of Material				
No	Name	Length	Width	Thickness
4	Sides	20½	2	¾
4	Sides	20½	1½	¾
4	Rails	10	3	¾
4	Rails	10	2	¾
1	Top	16	16	¾
32	Dowels	2	¾	Diam

Fig. 15. Working Drawing of Tabouret. Seventh Grade.

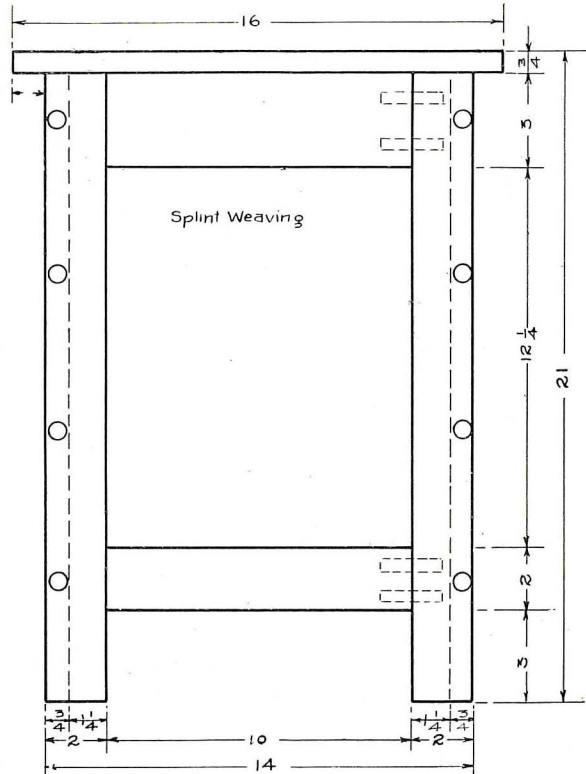
Fig. 9, raising the finger only to allow a strip to be placed. With the right hand weave a piece of raffia (single strand), Plate 3, around, going under and over as previously described. After two or three rounds the strips hold together and the finger may be removed.

In the circular weaving there is an even number of ends. This makes it necessary to allow the weaver to pass *under* two strips each time around. After weaving a few times around with the single strand the braided raffia may be introduced.

The Indians in making splint baskets use forms around which their baskets are woven. Plate 4 shows a number of forms made in wood.

After weaving the bottom of the circular basket it may be tied to a circular form in wood, as shown in Plate 5. The weaving may then be continued in either the braided raffia or a narrow splint may be used for the weaver. In making small circular baskets the Prang drawing blocks may be used.

The top of the basket is finished by weaving around twice, using the splint, as shown in the finished basket in Plate 5. In binding the top a strip of the heaviest ash, one-quarter of an inch wide,



is placed at top on the inside, and instead of over-casting with the raffia, as in the case of the tray, a narrow strip, one-eighth of an inch wide, of the lightest weight ash is used. No needle is required. The overcasting is done by running the one-eighth-



Plate 14.



Plate 15.

inch strip between the spokes and over the top. This is plainly shown in the finished basket, Plate 5.

Plate 6 shows a couple of work baskets, one woven in sweet grass and the other in braided raffia.

The basket shown in Plate 5 is woven of a braided rush, with a foundation of ash splints. The braided rush may be purchased of Jacob and Allison,

18 Cedar Street, New York, at the rate of thirty cents per bundle of forty yards.

Plate 7 shows other interesting forms of baskets, hair receivers, hair pin holders, etc.

In order that a greater number of spokes may be used as the foundation for a basket they are often cut as shown in Fig. 10.

This is done by moistening half-inch splints, folding into halves, and then cutting with the scissors. The spokes are then crossed, as shown in Fig. 11, and the weaving done the same as above described and shown in Plates 3 and 5.

To Make a Cover.

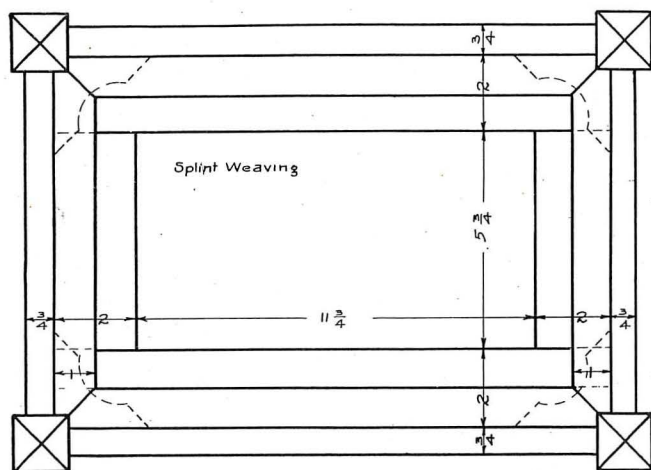
Proceed as when making a basket. When the weaving has reached a diameter large enough to cover the opening in basket remove it from the block and tie to top of basket.

The cover is finished by bending the spokes downward on outside of basket, and the weaving is completed while on the basket. In doing this the cover is certain to fit. The cover of the basket is finished the same as the top of tray, Plate 7 and Fig. 6. Baskets the size of those shown in Plate 6 should have foundation spokes from $\frac{1}{2}$ " to $\frac{5}{8}$ " in width.

Plate 8 shows two interesting work baskets, one made of sweet grass and splint, the other of raffia and splint.

Combination on Wood and Splints.

Wood alone is not sufficient for a course in elementary manual training.



Bill of Material				
No	Name	Length	Width	Thickness
4	Legs	12	$1\frac{1}{2}$	$1\frac{1}{2}$
2	Rails	$16\frac{1}{2}$	3	$\frac{3}{4}$
2	"	$16\frac{1}{2}$	$1\frac{1}{2}$	$\frac{3}{4}$
2	"	$10\frac{1}{2}$	3	$\frac{3}{4}$
2	"	$10\frac{1}{2}$	$1\frac{1}{2}$	$\frac{3}{4}$
2	Top	$15\frac{3}{4}$	2	$\frac{3}{4}$
2	"	$7\frac{1}{2}$	2	$\frac{3}{4}$
2	Trim	$15\frac{3}{4}$	1	$\frac{1}{4}$
2	"	$9\frac{1}{2}$	1	$\frac{1}{4}$
4	C Blocks	$2\frac{1}{2}$	$2\frac{1}{2}$	$\frac{1}{4}$

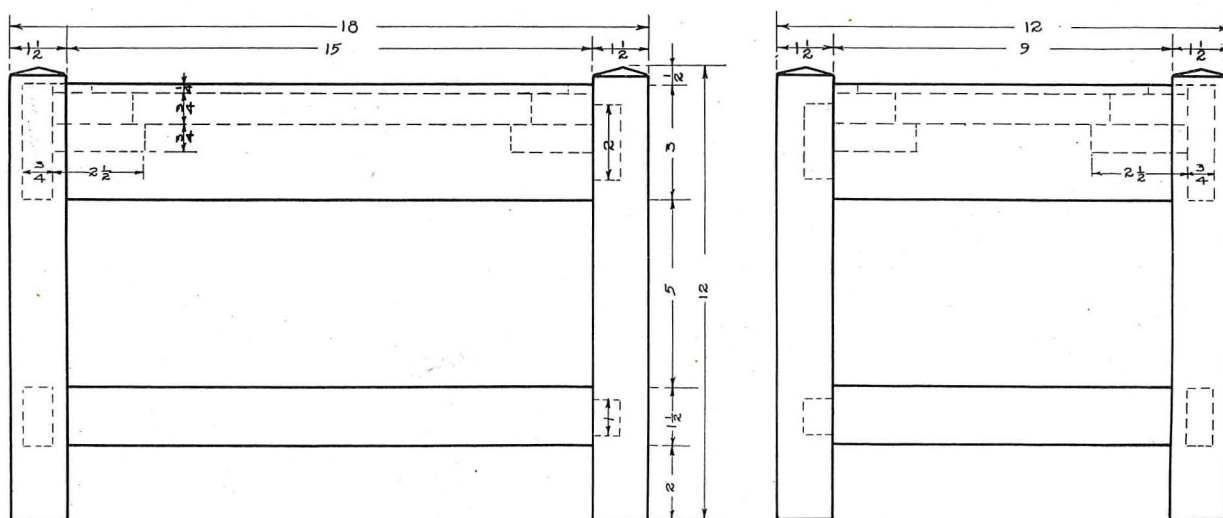


Fig. 16. Working Drawing of Foot-Stool. Eighth Grade.

time across the weaver passes under one and then over two and under two until across. The third time across the weaver passes over two, then under two, until across. The fourth time across the weaver passes over one, then under two, over two, et cetera.

The four above changes are the only ones necessary to produce the diagonal weave.

Continue the weaving by having the fifth weaver the same as the first, the sixth the same as the second, the seventh the same as the third, and the eighth the same as the fourth.

This order is followed until the entire panel is finished.

To weave the pattern as shown in the tabouret there must be an uneven number of vertical strips, Plate 9b.

It will be observed that the weaver starts out by passing over two, under two, and then over three. This must be so because of the uneven number of vertical splints.

The next weaver starts out by passing under one, over two, under two, and then under one, this being the center.

The third weaver starts out by passing under two, over two, and then under three.

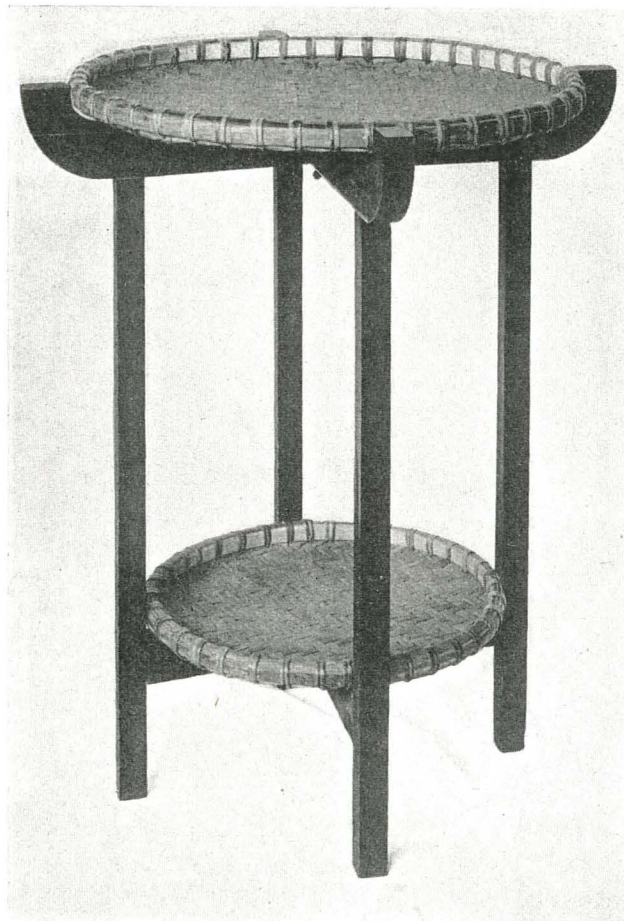


Plate 17.

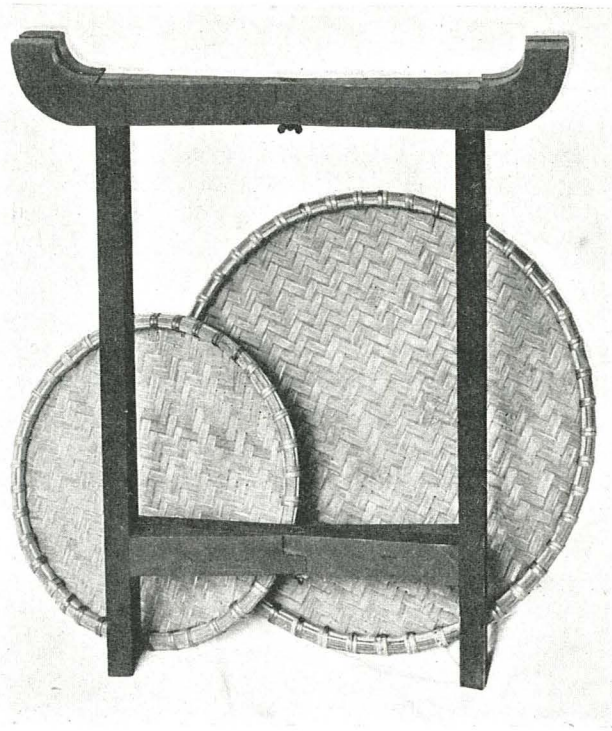


Plate 18.

The fourth weaver passes over one, under two, over two, and under one.

The four above changes are the only ones in the entire pattern. To continue allow the fifth weaver to follow the same course as the first one, et cetera.

Observe that every other weaver passes either under or over three vertical strips.

When the center of the panel is reached the second half is just the reverse of the first. In other words weave backwards by allowing the first weave below the center to follow the same course as the one just above the center.

The unfinished screen in Plate 10 shows the various stages of the weaving.

The material is moistened the same as when used in baskets. The strips used in the accompanying exercises are all cut one-half inch in width. To weave the panels in a screen proceed as follows:

First. Cut strips.

Second. Tack the strips to the upper cross piece of the screen as shown in the panel to the right, allowing the strips to hang as shown in cut. Use one ounce iron tack. These may be purchased in the curtain section of any department store or hardware store.

Third. Cut strips to be woven across about two inches longer than the distance across the panel. Begin to weave at top as shown in the center panel, Plate 10, and continue until the entire panel is completed. The tacking at the bottom and sides should not be done until the splints have thoroly dried.

Before tacking push the cross pieces one by one as close together as possible.

It will be found that owing to the drying out considerable space will be left at the bottom. Weave in additional pieces to fill this space.

Fourth. Before tacking moisten all ends to be tacked to prevent splitting. Draw each vertical splint until it is perfectly tight and then tack. Tack the strips down one side. Draw the opposite ends until the weavers are tight and then tack. When completed the panel will look like the one shown in Plate 10.

Plate 11 shows the finished screen with one-inch trim covering the tacked edges.

Rabbit the trim about one thirty-second of an inch in depth and three-fourths of an inch in width. This makes it possible for the trim to fit the face of the panel perfectly. Fig. 12 shows working drawing for screen.

Plate 12 shows a finished waste basket. This is a problem easily constructed by the pupils of the seventh grade. Fig. 13 shows the working drawing.

The mitered strips which cover the tacked edges are pieces only one-fourth inch in thickness. The one-inch trim might have been used the same as in other problems suggested.

The working drawing for the basket shows nothing but butt joints.

The panels for the basket are woven by tacking the strips to a drawing board.

The weaving is done on the drawing board and then transferred to the basket.

This method of weaving panels is pursued in weaving for small openings.

Plate 13 shows a finished fireplace basket. The working drawing, Fig. 14, shows the simplicity of its construction.

The handle may be made of any wood that can be made to bend after soaking in warm water.

Plate 14 shows a finished tabouret made with the top hinged, thus making it possible for any house-keeper to store away a number of articles.

This double use is quite worth considering, especially to those living in small flats.

Fig. 15 shows the working drawing.

The stool shown in Plate 15 is a little more difficult in its construction.

Fig. 16 shows the working drawing.

The top of the stool is woven by tacking the strips along the inner edge of one end of the frame. When the weaving is completed the opposite ends and sides are tacked to inner edges of frame.

This frame just fits the stool by cutting the corners as shown in Fig. 16.

The flower box shown in Plate 16 makes a most attractive problem for the pupils of the eighth grade. The panels for this may be woven as suggested in the case of the tabouret and waste basket.

Fig. 17 shows working drawing for plant box. A metal box is placed on inside of box to prevent water from dripping.

Plate 17 shows a most interesting tea table which may be folded and placed in a remarkably small space. The trays are woven of ash splint.

To make the tray the weaving is first done in the form of a square. A circular frame is made of the heaviest ash splints.

This frame may be made several thicknesses. The frame is now placed on the square weaving and a line drawn just outside it. When cutting the weaving circular, cut about one inch outside the mark. The ends are now turned upward next to the outside of the circular frame and held in place by using the one ounce iron tacks. Another frame is now made to fit the outside of the first one. When this is slipped in place the tacking is brought between the two frames.

To make the tray more secure a one-eighth inch strip of ash may be used to overcast top similar to the overcasting done in the basketry.

The ash splint can not be used in the seating of large chairs nor in any other large piece of furniture where strength is required, without being reinforced by a flat wire. This wire is woven at the same time the splint weaving is done.

Splint of ash, oak and hickory must, at least for a time, be used in place of the pith cane (flat reed) because of the scarcity of the latter on account of the European war.

The writer wishes to call attention to the fact that an effort has been made to keep the working drawings as simple as possible. It is hoped they are within the power of seventh and eighth grade pupils to construct, thus making the suggestions practical.

"Honorable industry always travels the same road with enjoyment and duty, and progress is altogether impossible without it."—*Samuel Smiles.*

FARM SHOP PROBLEMS

Louis M. Roehl, Milwaukee County School of Agriculture

STEP LADDER.

Material Required.

Lumber: 1 piece of Norway pine 1"x8"x10' 0"
Hardware: 18 flat head bright wood screws 2" No. 10
4 flat head bright wood screws 2" No. 10
4 round head blued wood screws $\frac{3}{4}$ " No. 6
2, 2"x2" steel box hinges
1 piece leather or canvas strap 21" long

Stock Bill.

Pieces	Finished Dimensions	Use
2	$\frac{3}{4}$ "x3 $\frac{1}{2}$ "x2' 9"	Front Standards
2	$\frac{3}{4}$ "x2"x2' 6 $\frac{1}{4}$ "	Back Standards
3	$\frac{3}{4}$ "x4 $\frac{3}{4}$ "x14 $\frac{3}{4}$ "	Steps
1	$\frac{3}{4}$ "x5 $\frac{1}{2}$ "x18"	Top
1	$\frac{3}{4}$ "x2"x16"	Top Brace
1	$\frac{3}{4}$ "x2"x13"	Bottom Brace

Directions.

1. Reduce all pieces to finished dimensions.
2. Set the T-bevel at an angle obtained by using 14 $\frac{3}{4}$ " on the beam and 6" on the blade of the steel square and lay out the bevel cuts at both ends of the front standards and remove stock to line.
3. With T-bevel set as for the standards lay out the cuts for the steps. Saw grooves $\frac{1}{8}$ " deep for the steps and remove stock with chisel.
4. Bevel the upper edge of the top brace with the T-bevel set as for the steps.
5. With the T-bevel set at an angle obtained by using 13 $\frac{1}{2}$ " on the beam and 6" on the blade of the steel square, bevel the lower ends of the back standards.
6. Lay out the gain for the bottom brace on the inside edges of the back standards $\frac{1}{2}$ " deep and 2" wide, 5" from the lower ends of the standards and fasten brace in place using two 2 $\frac{1}{2}$ " screws at each end.
7. Bevel both edges of the steps at the same bevel as used for the ends of the front standards.

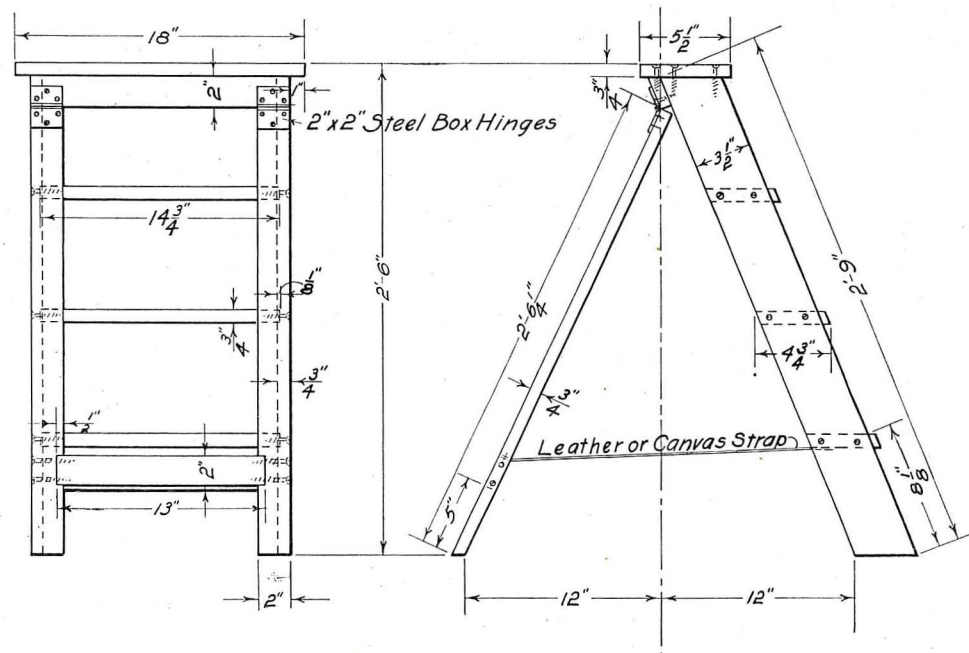
8. Fasten the steps by placing two 2" No. 10 flat head screws in each end of each step.
9. Fasten the top to the front standards, placing two 2" No. 10 flat head screws thru the top into each standard. Place screws as shown in drawing 10. Fasten the top brace to the top and front standards by driving two 2" No. 10 flat head bright wood screws thru the top into the upper edge of the top brace and one thru the brace at each end into the standard.
11. Fasten the back standards by placing the hinges as indicated in the drawing.
12. Fasten the leather or canvas strap to the lower side of the bottom step and the upper edge of the bottom brace by using two $\frac{3}{4}$ " No. 6 round head blued wood screws at each end.
13. Paint the ladder if desired.

CHICKEN BROODER COOP AND RUN.

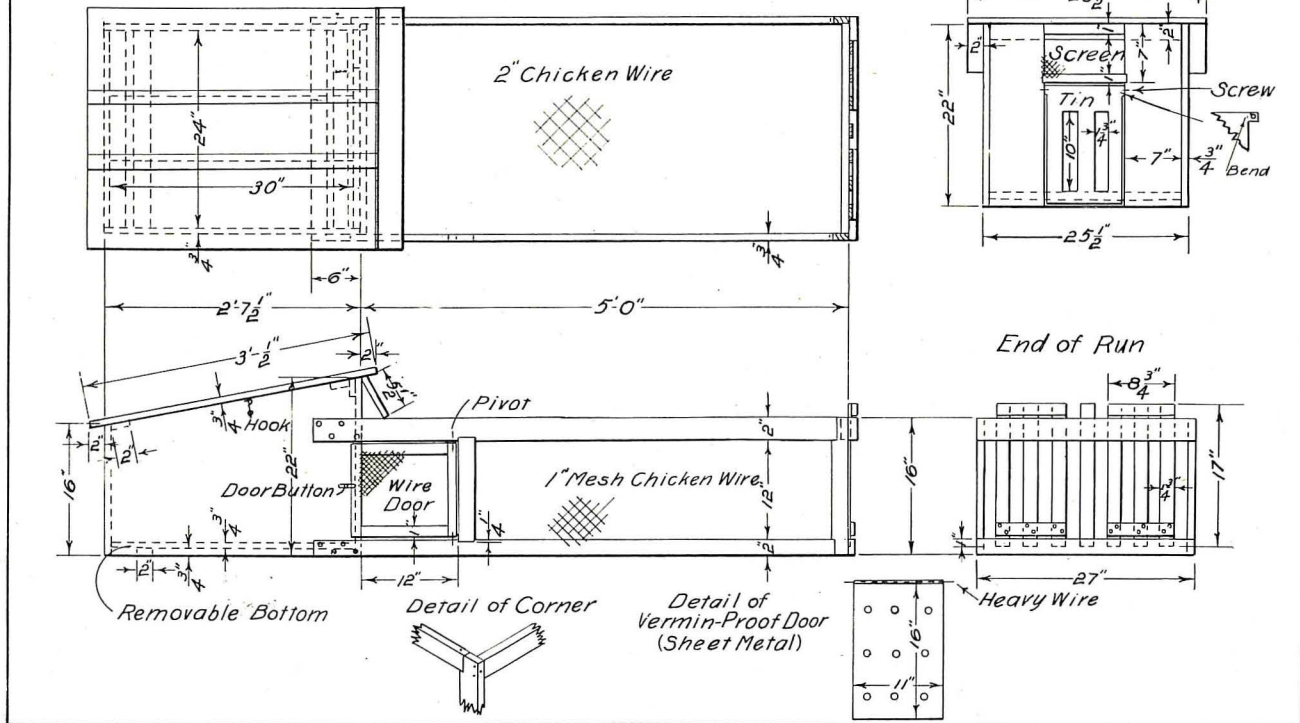
Material Required.

Lumber:
1 piece soft pine, cypress, fir or basswood 1"x11"x12' 0"
2 pieces soft pine, cypress, fir or basswood 1"x10"x12' 0"
Hardware:
 $\frac{1}{4}$ lb. 6d common nails
 $\frac{1}{4}$ lb. 8d common nails
30 8d finishing nails
16 3d fine shingle nails
16 flat head bright wood screws 1 $\frac{1}{2}$ " No. 9
27 flat head bright wood screws $\frac{3}{4}$ " No. 6
1 piece of fine screen 6"x11"
1 piece of fine screen 10 $\frac{1}{2}$ "x12"
1 piece of 1" mesh chicken wire 13"x3' 9"
1 piece of 1" mesh chicken wire 13"x5' 0"
1 piece of 2" mesh chicken wire 27"x5' 0"
2 gate hooks and eyes
1 piece heavy tin 11"x14 $\frac{1}{2}$ "
1 piece heavy tin or galvanized iron 11"x16 $\frac{1}{4}$ "
1 piece heavy wire 16"
 $\frac{1}{4}$ lb. $\frac{3}{4}$ " galvanized poultry netting staples

Step Ladder



Chicken Brooder Coop and Run



Stock Bill.

Pieces	Finished Dimensions	Use
3	3/4"x8"x30"	Bottom
2	3/4"x2"x24"	Bottom cleats
4	3/4"x11"x2' 7 1/2"	Side of coop
2	3/4"x8"x24"	Rear end of coop
2	3/4"x7"x22"	Front end of coop
1	3/4"x2"x24"	Cleat inside of front at top
2	3/4"x1"x10"	Front of coop
2	3/4"x10"x3 1/2"	Top of coop
1	3/4"x9 1/2"x3 1/2"	Top of coop
2	3/4"x2"x24"	Cleats for top
2	3/4"x1 1/2"x3 1/2"	Battens for top
1	3/4"x5 1/2"x29"	Rain shield at front
4	3/4"x2"x5' 6"	Sides of run
2	3/4"x2"x16"	Corner posts of run
2	3/4"x2"x25 1/2"	End of run
1	3/4"x2"x12 1/2"	Cross brace inside of run
2	3/4"x1"x11"	Top and bottom of side door
2	3/4"x1"x11 1/2"	Ends of side door
2	3/4"x2"x27"	Straps for door at end of run
4	3/4"x1 1/2"x8 3/4"	Straps at end of gates
7	3/4"x1 3/4"x17"	Uprights for doors
1	3/4"x3/4"x2"	Door button

Directions.

1. Reduce all pieces to finished dimensions and label each piece.
2. Fasten the bottom cleats to the bottom by driving three 6d common nails at each joint. The nails should be driven at a slant so as not to come thru.
3. Assemble top in same way as bottom.
4. Nail the battens over the joints on top of the coop with 3d fine shingle nails.
5. Nail the sides to the ends of the box by using four 8d common nails at each side of the back end and five 8d common nails at each side of the front end.
6. Fasten the two main front pieces by nailing to them the 3/4"x2"x24" cleat on the inside at the top. Cut gains 1" wide and 1/4" deep, 6" from the top on the inside edges of the main front pieces.
7. Fasten the two pieces in position indicated in the draw-


ing by toenailing them to the two main front pieces and fasten the 6"x11" fine screen with poultry netting staples.

8. Assemble the side door by using two 8d finishing nails to hold the butt joint at each corner.
9. Fasten the 10 1/2"x12" piece of fine screen to the side door with poultry netting staples.
10. Cut the head from an 8d finishing nail and cut it into two equal pieces for pivots for the side door. Drill holes for the pivots in the door and sides of run as indicated in the drawing and place pivots in the door.
11. Cut gains 1/4" deep in one edge of two pieces for sides of run 18" from one end for cross brace and fasten in place with two 8d finishing nails at each end.
12. Cut gains at both ends of corner posts 1/2" deep x 2" wide as shown in detail of corner and fasten corners of coop by placing four 8d finishing nails as shown in detail.
13. Fasten run to coop by driving four 1 1/2" No. 9 flat head bright wood screws thru each side of run into the coop.
14. Bore hole thru the center of the door button and fasten in place with one 3/4" No. 6 screw.
15. Cut the 11"x14 1/2" piece of heavy tin to the pattern shown in front of coop, drill a hole for screw in each flange, bend flange and place door in position with two 3/4" No. 6 screws.
16. Bore 1/2" holes in 11"x16 1/2" piece of sheet metal for ventilation, fold one end over the heavy wire as shown in detail drawing and fasten over front of main door with one staple at each end.
17. Fasten the straps to the pieces for the end gates by using two 3/4" No. 6 screws at each joint.
18. Cut grooves 3/8" deep and 1 1/4" wide in the straps for doors at end of run to receive the end gates.
19. Place gates in position and nail straps to end of run with two nails at each joint.
20. Fasten the chicken wire to sides and top of coop.
21. Fasten the rain shield in position shown in drawing by driving two 6d common nails into each main piece at front of coop.
22. Paint the coop and run if desired.

HOW YOU MAY KEEP YOUR CASES FREE FROM WRONG FONT TYPE

Edward T. Welsh, Instructor of Typography, Elm Vocational School, Buffalo, N. Y.



VERY printing instructor who takes pride in his schoolshop has, on more than one occasion, been confronted with the problem of how to keep his cases free from wrong font type. It is because of this fact that I am going to set forth the plan that has been worked out in our school to the entire satisfaction of myself and my pupils.

We use a distribution slip, such as the one reproduced with this article, and before a boy begins to distribute a job he must take a proof of it. After taking his proof he must mark the names of the type

faces on the proof, together with the sizes, and the rack in which the type belongs. After this is done he brings his proof to the desk for an O. K. If he has been successful in naming the type faces and sizes, the proof is O. K'd, and he marks the sizes on his distribution slip, together with his name and the name of the type faces.

He is now ready to begin distribution, and is more than likely to get the type in its proper place. After the job on which he is working is finished, he takes another and carries out the same plan on this, and on all subsequent jobs. The proofs of all these

DISTRIBUTION SLIP		
STRAIGHT MATTER		
Name	<i>Oscar Berglund</i>	
Date	<i>July 9, 1915</i>	

Time	Kind of Type — Size of Type	No. Ems
Total,		

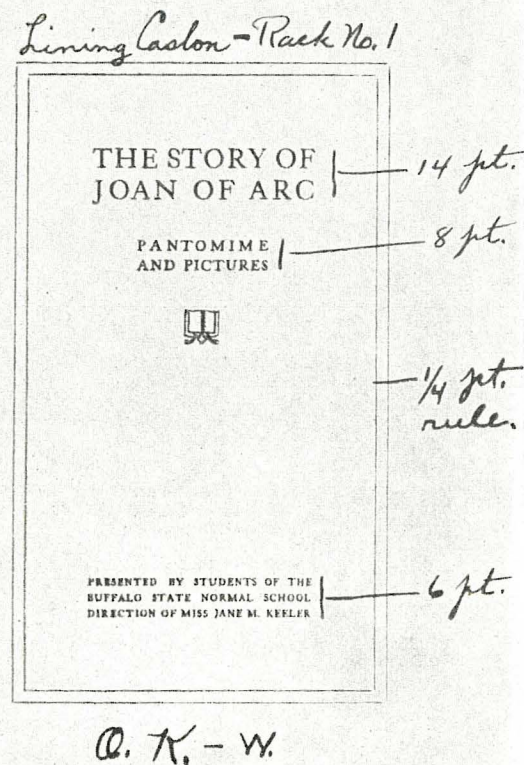
JOB WORK

Time	Kind of Job — Kind of Type	No. Ems
<i>9:45</i>	<i>Cover page - Caslon</i>	<i>432</i>
<i>10:00</i>		
<i>10:00</i>	<i>Letter head - Clearface</i>	<i>32.0</i>
<i>10:30</i>		
Total,		<i>752</i>

SIZES OF TYPE

<i>6</i>	<i>8</i>	<i>10</i>	<i>12</i>	<i>14</i>	18	20	<i>100</i> %
<i>24</i>	30	36	48	54	60	72	

A line may be drawn through figures to indicate size of display type.



This illustrates how the proof is marked by the pupil before he begins to distribute.

jobs are kept by the pupil until he has finished the distribution, when they are fastened to the distribution slip and filed on a hook which is kept for that purpose.

It sometimes happens, that even with this precaution, boys will get the type in the wrong cases, and when a thing like this occurs the proofs on the hook serve to guide you to the guilty party. All boys are instructed to report mixed cases to me the moment they discover them. When a case is reported mixed I make it my business to inspect it, and quite

frequently I remember who was distributing this particular kind of type. If I do not recall who the boy is, I pick out some of the mixed type and go thru the proofs on the hook until I find the proofs of this type face. It then becomes quite simple to locate the guilty young man. With the aid of the proofs I am able to form certain words of the type I pick out of the case, and when I have the words I have my boy, for his name is written on the distribution slip.

AAECFFHJN000ORRSTTY

This illustrates how the letters look when taken from the case after a case has been reported mixed.

When a boy mixes a case, and he knows by the proof and the words formed that it actually was he, he does not feel that he is being imposed upon when he is asked to set out the cases that are mixed.

Knowing, as boys soon will, that if they mix cases they will have to set them out, they will begin

to consider distribution in a more serious light and the instructor will not be called upon to put in so many wearisome hours trying to find a way to check this grievous fault of the beginner.

In this method there is also an excellent opportunity to teach type faces and type sizes. We use a booklet which contains all the type faces in the shop and the boys consult this book when in doubt as to the face. We also have each rack numbered and labeled. At the end of each rack hangs a glass

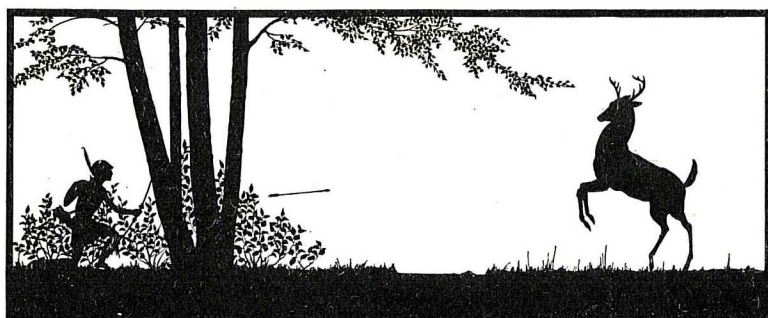
THESTORYOFJOANOFARC

This illustrates how the letters are made to form the words as shown on the proof.

frame which contains the name of the type in the rack printed in the face of that name. Our racks are so equipped that there are two series of type from 6 to 36 point in each one and each case has a number one inch high showing the size of type in points.

THREE INTERESTING HIAWATHA SILHOUETTES

Hiawatha Playing



The Hunt

Hiawatha and
Nakomis



INDUSTRIAL-ARTS MAGAZINE

Board of Editors

WILSON H. HENDERSON Milwaukee, Wis.
E. J. LAKE Champaign, Ill.
S. J. VAUGHN DeKalb, Ill.

EDITORIAL

CONVENTIONS.

Before another issue appears, the Eastern and Western conventions of drawing and manual training teachers will have been held—the former in Springfield, Mass., April 20-22, and the latter in Grand Rapids, Michigan, May 3-6.

The amount of uncompensated effort put forth for the promotion of a common cause thru the organization of its forces, is a fairly safe index of the unselfish spirit and purpose of an individual or publication.

Hence, the *Industrial-Arts Magazine* has no apology to make that from its establishment, its pages have been given liberally and gladly to the widest possible publicity of these two organizations, as well as to others in this field of educational activity.

This publication was dedicated to the work of unifying and making more effective the efforts along the various lines represented by these two bodies. We conceive it, therefore, to be one of the fine opportunities and privileges in this undertaking to push forward as vigorously as possible any movement which the teachers in these related lines of work deem worthy of their serious efforts and attention. We trust that every possible influence has been and will still be exerted to make the meetings this year as large and profitable as in the very nature of things they should be.

DRAWING AND THE ART TEACHER.

Drawing in the schools has passed thru successively interesting stages. The early purpose was industrial, and in the words of the art critic of the Centennial Exposition of 1876: "The foundation of all instruction in drawing, whether for industrial or artistic purposes, should be laid in the forms, facts and principles of geometry."

Some of us remember those exacting old type forms that gave us hours of trouble before our "plates" would pass muster. Then came a season of soft, expressive mediums when cloudy effects and vague contours were at a premium. This form of pictorial work was pronounced "artistic" over the tight, hard lines of the geometrical stage. It was certainly more impressive with its acreage of water colors and crayons in brilliant colors, and accidental variety of form, tone and texture.

The recent tendency of drawing has been relative to the making of some specific thing. Pictorial drawing is now threatened by the censors of art teaching, and "the cultivation of taste" is our watchword. The cultivation of taste in all things, with a minimum of time and technical practice is a large contract. To accomplish this task the art teacher cannot depend on himself alone. Inasmuch as the desired "taste" applies to the various activities of life and school, the art teacher must enlist other influences of the school as well as influences outside of the school, in behalf of its cultivation.

In the meantime, what of drawing? Does it remain the academic "hand maid" to design? Will the mere observation of designs good and bad cultivate taste? Will the short school periods allow of the execution of sufficient projects to cultivate taste in design? Will the art teacher be relegated to the past with drawing and "the cultivation of taste" be taken up by teachers of the various school subjects? Let us hope that the art teacher grows with his responsibilities and becomes a capable, enthusiastic disciple of all things beautiful.

"HIGHER TYPES OF INTELLIGENCE"

It is probable that the first person who used that expression "higher type of intellect" in speaking of ability which is manifested in writing books and making speeches, did so with fear and trembling. We suspect that he was compelled to compare his own ability with that which conceives, develops and makes mechanical devices, and he facetiously referred to his own as a higher type. Whether this be true or not, it is at least to be hoped that he had such a sense of humor.

The trouble with the expression is that it is used by so many people who have no sense of humor. They have heard the expression in school or elsewhere and, in their own egotism, have accepted it and used it. Such ability as that which invents and perfects electric lights, telephones, dictaphones, typewriters, railroads, aeroplanes and all the other devices which make civilization more comfortable than savagery, cannot be termed inferior. It is said that Thomas Edison has never made a speech in his life, yet who can place a value upon his life and work to society! The characteristic which distinguishes our civilization from that of the ancients is not our oratory—the ancient orators were far ahead of ours,—but it is our development in mechanical lines.

We suggest that such expressions be used carefully and with extreme caution. Merely repeating what has been read, or heard, should not be mistaken as a sign of intelligence. A phonograph can be purchased for \$15 which can do that much, and unless we can do more with a received expression of thought than a phonograph does, we should not fool ourselves by thinking we are exceptionally intelligent.

A TEACHER OF DRAWING WANTED.

The *Industrial-Arts Magazine* is in receipt of the following letter from the superintendent of a city school system in the Middle West:

"I am interested in an A-No. 1 drawing teacher providing I can find what I want. I have had three music and drawing teachers in five years and I have failed to get what I want in drawing. The whole drawing work as it seems to be conducted by the supervisors seems to me a farce if not a tragedy. It seems that all the time that these boys and girls put in this subject is lost time and lost energy.

"Do you know anywhere in this country of a drawing teacher that correlates adequately the work of her department with manual training work, with domestic science work and with the practical needs in the life of the average girl or boy? Do you know of a drawing teacher that does not have the boys in the seventh and eighth grades drawing pictures of pin cushions and have girls in mechanical drawing making pictures of wheelbarrows and wagons? I want to get hold of, if I can, of somebody that knows her subject well enough and who is so much bigger than the subject that she handles and can make that subject fulfill a proper purpose for which any and all public school work should be conducted.

"I may be a crank on this subject, but I have reached the point where either I am going to accomplish something with drawing that is conducted in my schools or else I am going to eliminate the subject from my curriculum.

"I want somebody that can develop the power side, and the economic and industrial sides of this subject known as public-school art.

"Do not have any candidates write to me, write directly to me yourself before taking any further action on this letter in case you are sure that you have someone in mind that will vitalize and utilize a course in public-school drawing."

The above letter explains very concretely what superintendents are demanding of their art teachers and why so many art teachers fail.

MODERN APPRENTICES.

The following are extracts from a letter written by an apprentice to the *Inland Printer* and quoted in its March number:

"I am employed by one of the large magazines, and am the only apprentice in the shop. I have been on the payroll for eighteen months, and during that time I have learned how to cut slugs, set heads, and pull and correct proofs. Wonderful, isn't it? I don't think.

"Once in a while I get a chance to justify or lock up a page form, but only when the floorman (he is also chairman of the chapel) is very busy. At any other time he will tell me to go back to my bank. So much for practical education.

"I am financially unable to take the I. T. U. Course. . . . But, supposing that I were able to take the Course at the present time, what good would it do me? There is nothing artistic about a galley proof, and no great amount of brains is required to sort out the leads and rules that the floorman sends

me with unfailing regularity. And that seems to be about all that is required of me. An attempt to do anything else usually meets with the reminder that I am not paid to do a journeyman's work. And this is a union shop, too."

This recalls to a good many of us experiences in the early struggles of becoming a printer. If such a thing were publicly said about any school that pretends to do anything with printing, what a furor of protests and criticisms would go up against the "impractical" school from those outside the school.

The fact is that a boy in almost any school printshop gets more in three weeks than this young man represents to be the result of "eighteen months on the payroll." This situation may not be alarmingly prevalent, but it is widespread enough to cause the Editor of the *Inland Printer* to say, "Without question, this is only one case out of many, and it should cause some deep thinking on the question of what will be the status of the future printer if more care is not given to the education of the apprentice of today."

So, the slogan so much heard now, "Do things as they are done in the trade," should be qualified with some such wise precaution as, "*provided they are properly done in the trade,*" which would be less specific to be sure, but infinitely less dangerous.

DRAWING AND SALESMANSHIP.

"In going over the work of our salesmen who use freehand and those who do not use it, I find that the ones who are the most proficient in this line are invariably the best salesmen. I am inclined to think it would be well if all of our salesmen were good at freehand."

This is quoted from a letter we received from the sales manager of Kawneer Manufacturing Company, who make and sell metal store fronts, mouldings, casements, sash, etc.

Interesting evidence, is it not, of the money-making value of ability to express ideas thru free-hand drawing?

The man of today who has to do with the employment of men witnesses no sadder sight than the procession of unemployed men that are exemplary in life, have some general intelligence, are respectably honest and frequently of good social position, and yet who can get only menial, routine, poorly paid positions. The reason for this is that they have no definite knowledge, no special experience. They can do almost anything, they say; which really means that they can do nothing. The successful man of today is he who knows how to do one thing better than most other men can do it.—*Edward Bok.*

PROBLEMS AND PROJECTS

THE Department of Problems and Projects, which is a regular feature of the INDUSTRIAL-ARTS MAGAZINE, presents each month a wide variety of class and shop projects in the Industrial Arts.

Beginning with January 1, 1916, the Magazine will award a monthly prize of \$10 for a meritorious problem used in the Department. This is not a prize contest in the ordinary sense. Every problem accepted for publication will be paid for. The prize will be simply a reward of merit.

From the material submitted by readers, the Editors will select each month for the award one problem of especial merit, judged from such standpoints as originality, good construction, artistic merit, adaptability to school work, and quality of drawings and photographs submitted.

The brief description of constructed problems should be accompanied by a good working drawing and a good photograph. The originals of the problems in drawing, design, etc., should be sent.

Problems in *benchwork, machine shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work*, and other lines of industrial-arts work are eligible for consideration.

Drawings and manuscripts should be mailed flat and should be addressed:

The Editors, INDUSTRIAL-ARTS MAGAZINE,
Milwaukee, Wis.

THE MAKING OF A TEA WAGON.

C. H. C. Dudley, Keene, N. H.

The problem of making a tea-wagon involving good lines, and yet simple enough to admit of being constructed by a grade boy or girl in a normal school, with the ordinary equipment in the shop, has always appeared to me as a difficult one.

The wagon described was designed and constructed by Kathrine B. Smith, a senior girl of 19 years, in the Manual Training Shop of the Keene Normal School, Keene, N. H. The construction is not difficult, the lines are pleasing and the entire piece is a very useful one for any home.

The basis of the tea-wagon is a tray, made of regular oak picture moulding, two inches wide. The moulding which comes sanded, but unfinished, is kept in the shop for picture framing. From the moulding, a picture frame 30 by 17 in. is made. Any harmonizing material may be placed under the glass. In this case, natural-colored Russian crash was used, with a large letter S embroidered on it. The frame is backed up with thin pine, and the whole covered over with billiard cloth felt. Two solid brass handles are fitted to the ends of the tray, before the felt is glued on. It will be seen that the tray can be used separately.

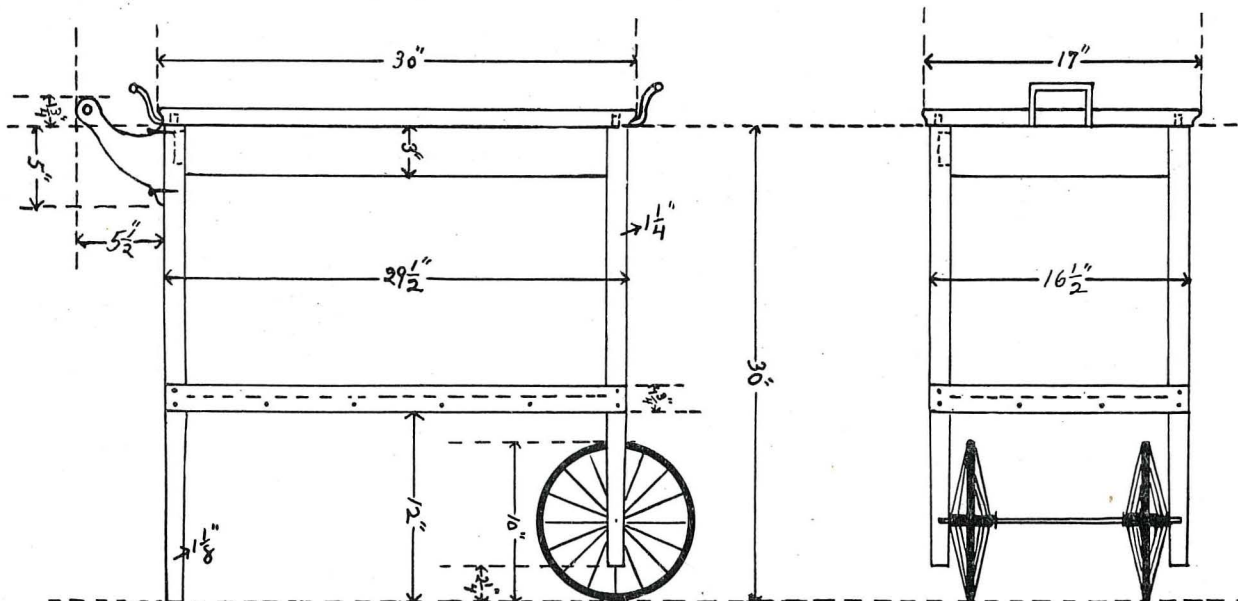
The framework of the wagon is a small sized table frame, 29½ in. by 16½ in., of the regular mortise and tenon construction. The posts are 1½ in. square and 30 in. long. Beginning eighteen inches from the top, the posts were tapered gradually, for the remaining 12 in., down to 1½ in. square.

The rails are 3 inches wide and ⅞ of an inch thick, and are mortised in and primed.

The shelf is glued up from ⅞-in. boards, and is fitted in around the inner corner of the posts. The shelf is screwed fast to the posts from the under side, about eighteen inches from the top. Extending around the shelf, and fitting flush with the bottom, are placed narrow oak strips 1¾ in. wide and ⅜ in. thick. The oak strips are fitted around the outside of the posts and are mitered at the corners. The drawing shows the screws used to fasten the strips to the framework.

The handles are shaped out of ⅞-in. wood and are screwed fast to the posts with long screws. The shaping of the pieces can be done to suit the individual taste, but it is recommended that the shape be drawn life size as a beginning. Running thru the two pieces is an oak rod ⅝ of an inch in diameter, which projects thru a distance of one inch on either side. The rod may be purchased at any furniture factory. The handles, in height, are about ¾ of an inch above the level of the wagon with the tray on it.

The tray fastens to the framework in this fashion: In the center of the top of each post, a little pin, made of a ¼-in. dowel rod, is inserted. These are rounded off neatly. In the proper place on the bottom side of the tray, a hole is bored thru the felt, into the wood. If the holes are bored carefully, the tray will extend over the framework ¼ of an inch on each side; if they are bored with the ⅛-in. bit, the tray can be slipped on either way one approaches the wagon, which is a convenience.



DETAILS OF TEA WAGON.

Because of the added appearance, small wheels have been selected. Some ten inch rubber-tired baby-carriage wheels were purchased from a furniture store. The wheels had metal spokes so these were scraped and refinished with golden oak Jap-A-Lac.

The rod upon which the wheels revolve is $\frac{1}{4}$ of an inch in size. A cotter pin has been run thru it on the inner side of each wheel, to keep them from slipping toward the inside. The other ends of the rod are fitted into the holes bored at the right place on the posts. The rod with the wheels in place are slipped into position when the rail is glued to the posts. The posts where the wheels fit should be sawed $2\frac{1}{4}$ in. shorter than the other posts.

The finish, which is optional with each individual, is golden oak stain, with the usual coats of filler, shellac and furniture varnish.

The following is a detailed list of the material and the cost of each article:

10 B. F. Oak.....	\$1.00
Moulding.....	.40
Brass Handles.....	.40
Glass.....	.39
Wheels.....	.50
Oak Rod.....	.05
Rod.....	.25
Screws.....	.06
Gliders.....	.03
Billiard Cloth.....	.10
Crash.....	.25
Finishing.....	.40

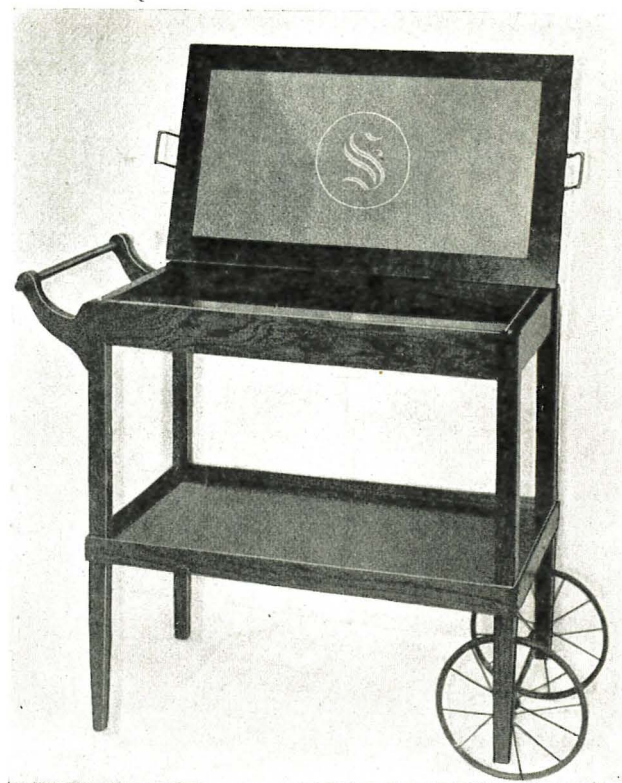
Total.....\$3.83

A FINGER LINK.

Lee M. Klinefelter, Instr. Bench and Forge Work, Fort Lewis School of Agriculture, Hesperus, Colo.

The finger link shown is of the type commonly used on the "rough lock" chain in mountainous countries. It has an advantage over a grab hook in that it is easily opened, no matter how tight the chain is pulled. The stock used is heavy enough to make the hook suitable for actual service, which adds to the interest with a great many students.

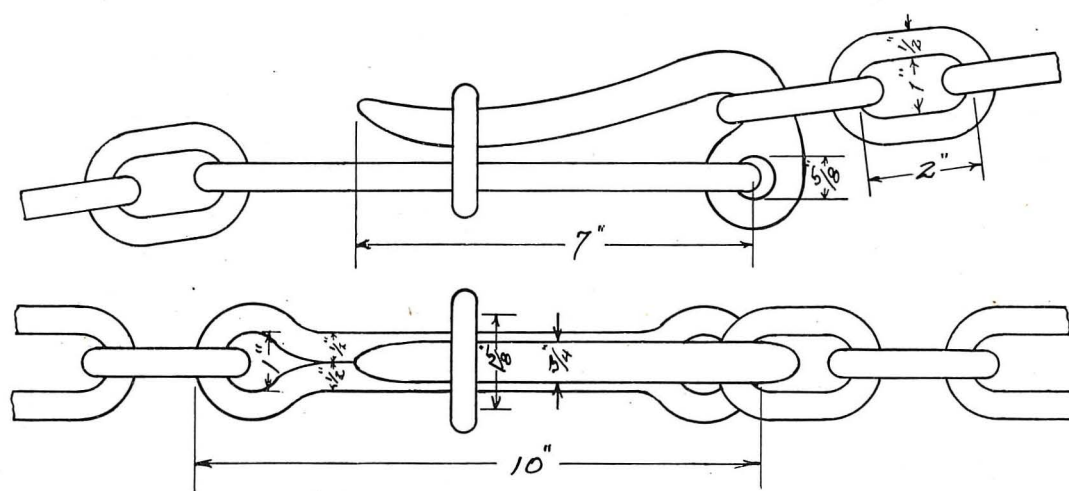
As a project in elementary agricultural forging, I have



TEA WAGON.

found it very satisfactory after the boys have had some experience in eye forming and punching, and link welding. It is complicated enough to hold their interest, and calls for some ingenuity in assembling.

The ring and the hook should be first made. The center of the stock for the long link is then heated, partly shaped into the loop for one end, the hook slipped on and the loop closed. The ring is slipped over the two ends, which are then opened into a loop, scarfed and welded. A short link may be made up and inserted in the end before welding, but



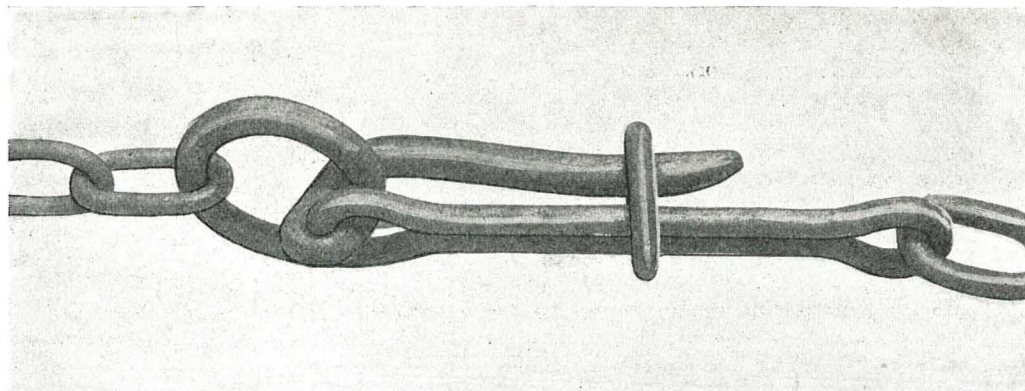
Stock-Long Link- $\frac{1}{2}$ " \times 24" S.S.

Hook- $\frac{3}{4}$ " \times 11" S.S.

Ring- $\frac{1}{2}$ " \times 7" S.S.

Links- $\frac{1}{2}$ " \times 7" S.S.

L. M. Klinefelter.



FINGER LINK.

it increases the difficulty of making the weld, and may be more easily welded on after the long link is completed.

Soft steel is very satisfactory material for this project, but Norway iron may be used if difficulty is experienced in welding.

A SOILED CLOTHES HAMPER.

E. M. Cook, Des Moines, Ia.

This soiled clothes hamper has proven not only pleasing in appearance but satisfactory in everyday use. It may be made to match the finish of the bathroom and may be enameled or finished in panel effect.

In use, the clothes are inserted at the top and removed

by opening the front panel. A catch at the bottom holds the panel in place.

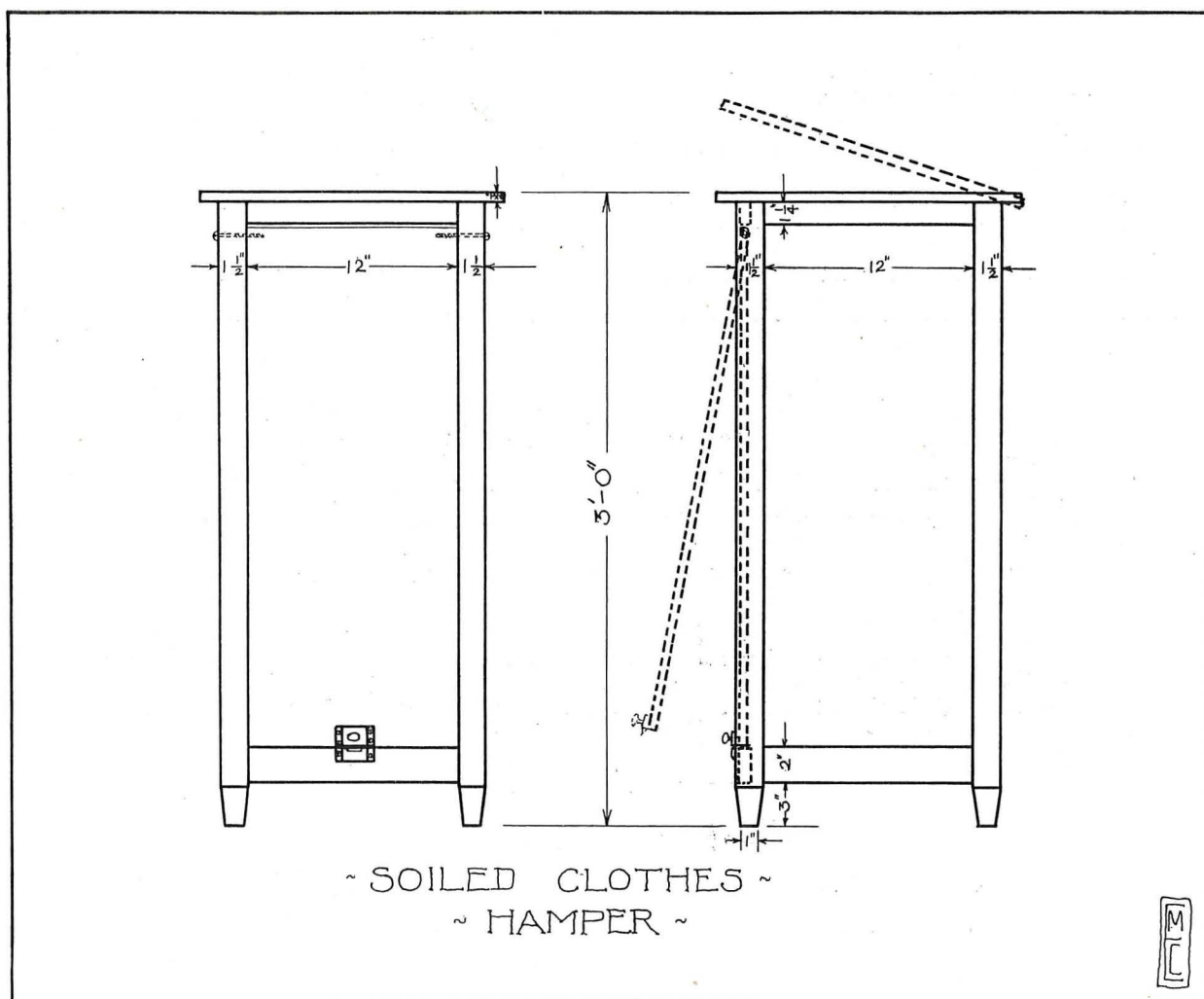
If this hamper is to be enameled, the sides are made of any patent wall board. In the hamper illustrated, the boards were of $\frac{1}{2}$ -in. by 12-in. poplar, enameled.

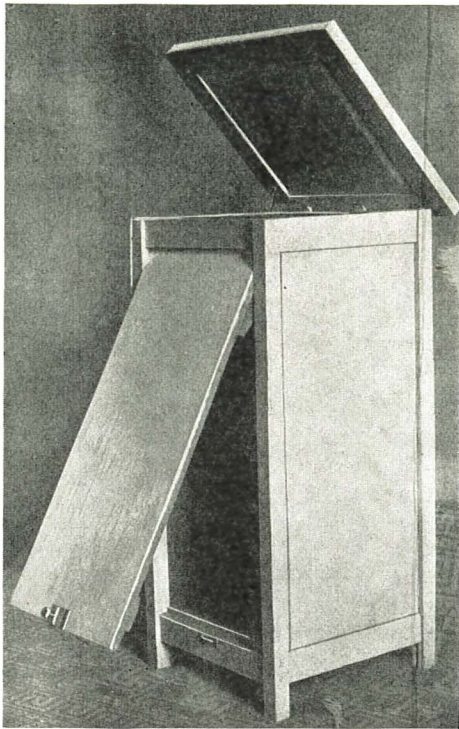
The front swings on a pivot of round-head blue screws, set in grooves plowed in the rails and legs. The front may be paneled or made of one solid board.

METALWORKING VISE.

Edward Berg, Washington High School, Milwaukee, Wis.

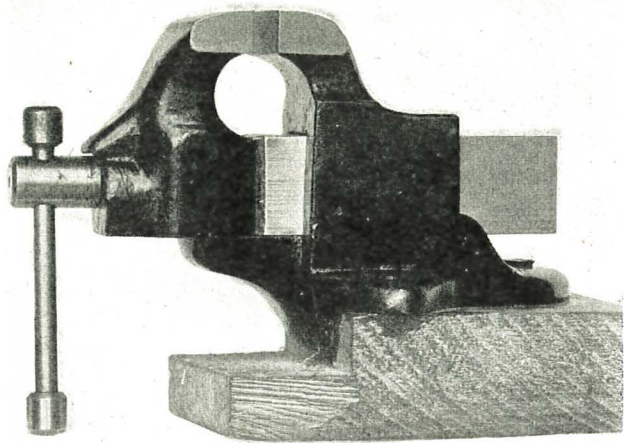
There is a fascination about working with machine tools that appeals to the interest of a boy. Repeated exer-





SOILED CLOTHES HAMPER.

cises in the lathe or in the shaper do not bore him as do repeated exercises in the wood-turning lathe or at the wood-working bench. There is something in the cutting of metal which holds his interest even tho he is not "making something." The writer, however, believes that there is added interest and effort with problems that are of interest to the

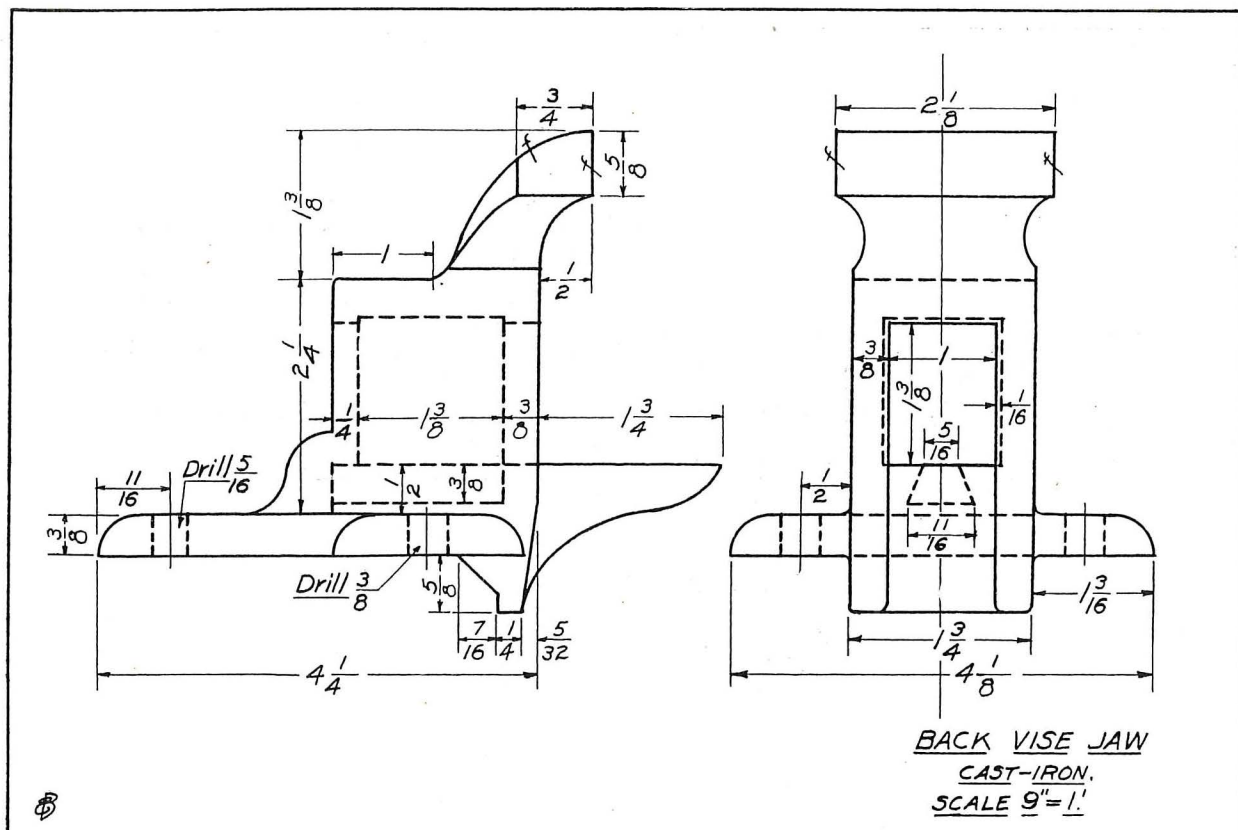


THE COMPLETE VISE.

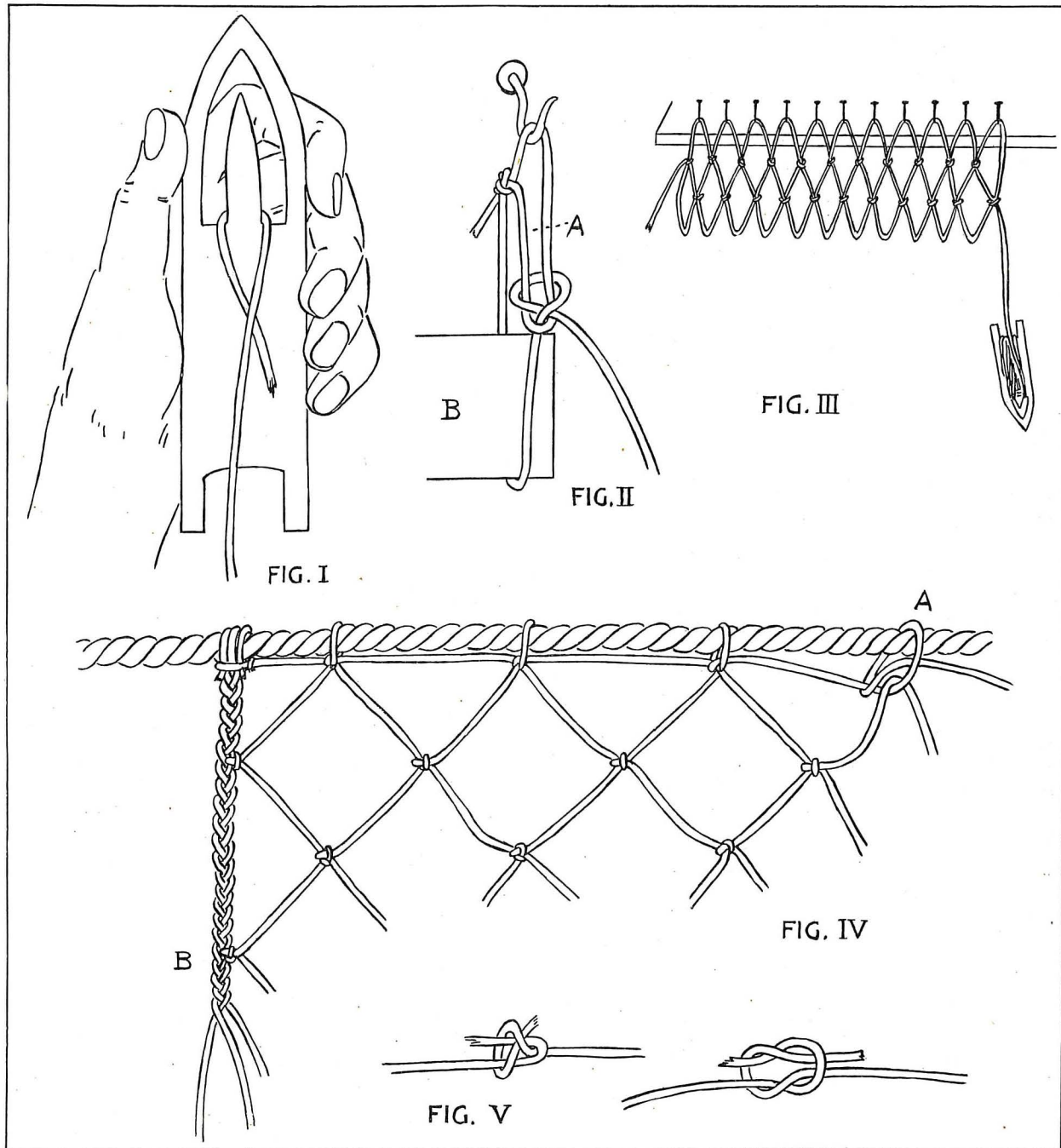
student as a finished problem and that retain the good features of a pure exercise.

The Paper Punch, an account of which was published in the March number of this magazine, takes the place of the old chipping and filing block which was generally labeled "paper weight." The Metalworking Vise which has been used by the writer for several years in classes in machine-shop practice, embodies work in the lathe and shaper and is valued by the student when finished.

The blank for the screw may be used as a first problem in the lathe. A piece of machine steel $1\frac{1}{2}$ in. or greater in diameter, is first turned to 1-in. diameter. This may seem like an unnecessary waste of stock but it gives the pupil an opportunity to learn the proper shape, position and cutting



DETAIL OF VISE.



DETAILS FOR MAKING TENNIS NET.

knob is turned, centered, drilled, countersunk, and cut off in the chuck and is ready to be fastened to the handle. The nut is cast of soft brass, centered at both ends, and drilled in the lathe or in a vise at the drill press. The threads are cut with two taps, a roughing tap followed by a finishing tap. The threads are now cut on the screw in the lathe and it is fitted to the nut.

The front vise jaw is cast so that there is a little clearance at the end of the cut in shaping the top and sides of the beam. It is set up in the shaper vise, affords an excellent problem in shaper work, and includes horizontal, vertical, and curved surfaces.

The back vise jaw is cored to fit the beam of the front jaw with a small amount of filing. In setting up the back jaw in the shaper vise the front jaw is inserted, leveled with the table and squared with the ram. The jaw faces will

then be true with the hole and will be parallel to each other when assembled.

The retainer is cut from sheet brass and is held in place with a small machine screw, the hole for which is drilled and tapped thru from the outside. The nut is held in place by a $\frac{1}{8}$ -in. steel pin driven just back of it. The hole for the pin is drilled from the bottom of the rear jaw so that it just touches the back end of the nut when it is in place. The remaining steps necessary to complete the vise will suggest themselves in the drawing.

TO MAKE A TENNIS NET.

Leslie W. Bailey, Gerry, N. Y.

Late in September we decided to have a tennis court in the back yard of our school grounds. As the season was so advanced, we wanted to get our equipment as soon and

with as little outlay as possible. Our home-made net, which materialized in our schoolroom, served our purpose satisfactorily.

The materials needed are: Forty-four feet of $\frac{1}{4}$ -in. Manila rope, a quantity of seine twine, or any good strong cord, and a fisherman's shuttle which may be made as follows: get a cigar box cover, or any piece of wood about $\frac{1}{8}$ -in. thick, cut it down to 8 in. x $11\frac{1}{2}$ in., then round off one end and cut a double slot in it, leaving a tongue, as shown in Fig. 1. Great care must be exercised in cutting this slot or the shuttle is likely to be broken. Then cut a square notch in the other end as shown in the figure.

To thread the shuttle hold it in the left hand, pointed end up, and taking the string in the right hand, push a loop of the cord up thru the slot over the point, and draw it down around the point as in Fig. 1. Wind it down in the square notch and again up on the other side of the shuttle, and push it around the point and down, until the shuttle has as much as it will hold.

You are now ready to begin. With eight or ten inches of cord left free, tie a loop in the end, and hang it over any convenient hook or nail (A, Fig. 2). To get the meshes of uniform size, a measure made of thin wood or strong cardboard is used. This should be as wide as the desired mesh. Two inches is a suitable size, and will make the meshes two inches square.

Now pass the shuttle up thru the first loop, and insert the measure (B, Fig. II). Draw up the cord until the measure just touches the first loop, then pass the shuttle around back of loop A and down in front of it and under the cord itself. Remove the measure and draw the cord tight, and the first knot is made. Now pass the shuttle up thru the loop where the measure was, letting the cord off the shuttle when necessary, and pass the shuttle around back of the loop as before, and continue in this way until enough meshes have been made to make the net the desired length. For a net 32 ft. in length, approximately 160 meshes will be required, counting them diagonally and not laterally. In order that more than one person may work at it at a time, the net may be made in sections and the parts skillfully knotted together.

After the length has been determined, get a piece of board $6\frac{1}{2}$ ft. long and drive in a row of shingle nails 1 in. from the edge and $\frac{1}{2}$ in. apart. Now hang the loops upon the nails as shown in Fig. III, first taking out the first loop made, as it is not of the right size. Now weave back and forth across the bottom, taking the loops in succession, until twelve meshes, counting with the diagonals of the meshes, have been made. This will make the net three feet wide. It often becomes necessary to refill the shuttle and tie the ends of the cord together, and for this you want a knot that is compact and will not pull out. Fig. V shows two knots that are satisfactory for this purpose.

Instead of the $\frac{1}{4}$ -in. rope mentioned above, a serviceable one may be made by braiding together three strands of binder twine. Leaving four feet of the rope to tie to the posts, make chalk or pencil marks $2\frac{3}{4}$ in. apart until four feet from the other end; or another measure may be used instead. Fasten up the rope like a clothes-line at any convenient height and beginning at one corner of the net, bind the top side to the rope, as in Fig. IV, using the shuttle, and tying each loop in succession at one of the marks. The knot used is shown at A, Fig. IV. The ends and bottom must also be bound with a heavier cord than that used in the body of the net, or three strands of the seine twine may be braided together and the loops knotted in as they are reached, B, Fig. IV. Ends for tying to the posts must also be left at the bottom of the net, and when stretched up properly this net will look as good and under proper care will give as much satisfaction as the \$10.00 kind.

PRINTING CLASSES FOR APPRENTICES.

A form of agreement to be entered into by the school board of Cincinnati, the employing printers and the apprentices in the trade has recently been prepared by Supt. R. J. Condon. The form has been approved by a special committee of nine of the schools, the Franklin Club, Printers' League and the allied printing trades.

The plan, upon approval and adoption, will provide a working agreement between the schools and the printing trade, for developing a five-year course for apprentices in the trade. Under the plan, the print shop becomes the laboratory of the school and the academic instruction is given in the regular classrooms.

It is proposed that work and study, theory and application, shall be unified in the school course and that the interests of pupils shall be safeguarded by the schools.

THE VOCATIONAL EDUCATION ASSOCIATION OF THE MIDDLE WEST.

The second annual convention of the Vocational Association of the Middle West was held in Chicago March 30, 31 and Apr. 1. This was an unusually successful and a remarkably well attended meeting. At some of the sessions, notably the first session Thursday afternoon when the Gary System was under discussion, the grand ballroom of the La Salle Hotel was taxed even to the limit of its standing room capacity.

The Thursday afternoon program consisted of a description of the Gary System by Assistant Superintendent Swarts and Mr. Wulfin, Director of Industrial Education of Gary, and a discussion of New York's experiences with the Gary idea by Mr. W. E. Grady, Prin. of Public School No. 64, New York City. This was a most interesting and spirited debate.

Thursday evening, March 30, occurred the annual banquet, over which Prin. Bogan of the Lane Technical High School presided. Addresses were given by Dr. Prosser of Minneapolis, Mr. Olander of the Illinois Federation of Labor, and Supt. Shoop of the Chicago schools.

A conference was held Friday morning at the City Club. Delegates from a great number of organizations in Illinois attended the conference, and discussed ways and means of securing state aid for Vocational Education in Illinois. In the afternoon, "Work for Women" was the topic of the meeting presided over by Miss Dora Wells of the Lucy Flower Technical School for Girls, Chicago. Prominent among the speakers of this session were Mrs. Lucinda Prince, Boston; Miss Marlatt, University of Wisconsin; Miss Bonnie Snow, Millburn, N. J.; Miss Emma M. Church, Chicago; and Miss Blanchard, Milwaukee.

At the two Saturday sessions were discussed the problems of employment, vocational guidance, pre-vocational work, and kindred topics. These subjects were handled by such authorities as Assistant Superintendent Fletcher, Rochester, N. Y.; Mr. Geo. H. Miller, Employment Manager, Sears, Roebuck & Co.; Mr. Paul Stetson, Prin. South High School, Grand Rapids; and Miss Edith Brown, Lane Technical High School, Chicago.

During this meeting, there were interesting and well attended conferences and programs on Agricultural Education. Many prominent people in this field of work participated in the program.

Besides these important features of the meeting, may be mentioned the fact that thirty rooms on the eighteenth floor of the La Salle Hotel were occupied by extensive exhibits by various commercial firms.

All told, the meeting was a splendid success and Mr. Leavitt, the president, and his co-workers are to be congratulated.

SUMMER COURSES IN NEW ENGLAND.

The Directors of the Commonwealth Art Colony, Boothbay Harbor, Me., have announced the annual summer courses for 1916. The school offers courses in drawing, painting, design, manual training and metal work under the direction of a number of well known teachers of industrial arts and industry.

The Art Colony, which is located on the top of a picturesque hill overlooking the village of Boothbay Harbor, is an especially attractive place, and during the summer is a popular gathering place for artists, musicians, writers and teachers. Both outdoor and indoor living quarters are open to the students in the cottages and at the village hotel. Table board is provided by the meal, day or week at the central dining hall.

The studios and workshops are well equipped for serious study, and healthful recreation is combined with classwork so that the best results are obtained. Teachers who are looking for a suitable summer school and a quiet place in which to work and rest, should address Mr. Asa G. Randall, 494 Broadway, Providence, R. I.

THE SPRING CONVENTIONS

Greetings and an Invitation

To the teachers of drawing, manual training, domestic science and vocational subjects, Greetings.

The Eastern Arts Association extends to each and every teacher interested in drawing, manual training, domestic science and vocational subjects, a cordial invitation to attend the annual meeting of the Association, to be held in Springfield, Mass., April 20th, 21st and 22nd.

The local committees, Chamber of Commerce and other organizations are making arrangements so that each and every teacher who attends the meetings will have ample opportunity to visit many points of historical interest.

The wives who accompany the delegates will be entertained by a special program to be given in the mahogany room of the auditorium, Friday afternoon. Many commercial houses which have never before exhibited, will exhibit this year. The exhibits will not be confined to supplies alone, but many will consist of valuable demonstrations in laboratories erected for that purpose.

The program arranged by the committee is as strong as any program ever arranged for the Eastern Arts Association. Topics of interest to all teachers will be discussed by specialists. Numerous luncheons have been planned, so that those interested in special problems may meet and continue the discussion.

The general meeting and the exhibits will be held in the municipal auditorium, called the most beautiful concert hall in America.

COME: Let us make the slogan "On to Springfield," a reality.

MILLARD B. KING,
President Eastern Arts Association

EASTERN ARTS ASSOCIATION.

The convention of the Eastern Arts Association promises to be the largest gathering of directors and supervisors of art instruction, manual training, household arts, vocational and industrial education which has been held east of Pittsburgh. A number of circumstances are contributing to make the coming convention in Springfield a record-breaker in point of attendance and interest. The most important circumstance is, of course, the program which includes not only men and women of preeminent importance as directors but also leading men in the art industries.



MILLARD B. KING,
Harrisburg, Pa.



FRED P. REAGLE,
Montclair, N. J.

The meetings will be held in the new municipal auditorium which has been called, with reason, the most beautiful meeting hall in the United States. The exhibits will also be housed in a hall of this building. The local pre-vocational and trade schools will be open to the visitors of the convention and many industrial establishments which are co-operating in industrial education, will open their doors. Among the features of the program are the following:

Thursday Morning, April 20.

Opening Session.

The Art High School, Dr. Felix Adler, Ethical Culture School, New York City.

Thursday Evening, April 20.

Banquet—Hotel Kimball. Dr. David Snedden, Prof. Alfred V. Churchill and Mr. Henry T. Bailey.

Friday Morning, April 21.

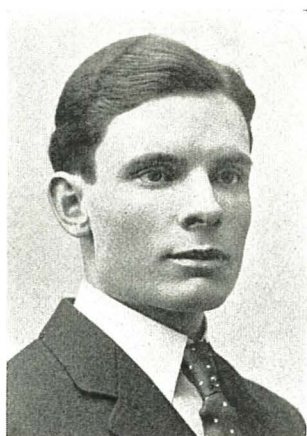
To What Extent Can the Museum be Used by the Teacher of Fine and Industrial Arts, Miss Edith Abbott, Metropolitan Museum, New York City.

Opportunities for Art in Modern Journalism, Dr. Talcott Williams.

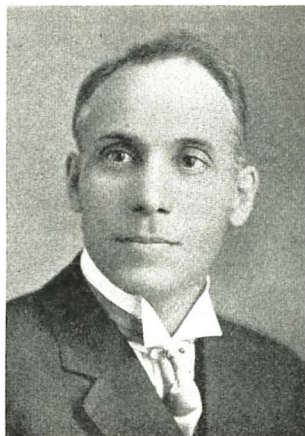
Industrial Education in Present School Problems, Dr. Frederick G. Bonser, Professor of Industrial Education, Teachers College, Columbia University.

Saturday Morning, April 22.

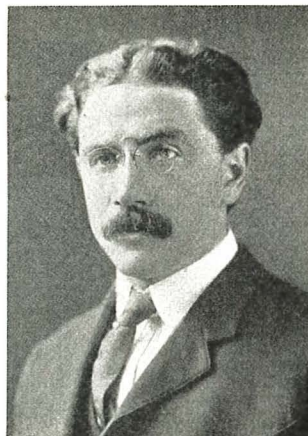
Address—Arthur W. Dow, Professor of Fine Arts, Teachers College, Columbia University, New York.



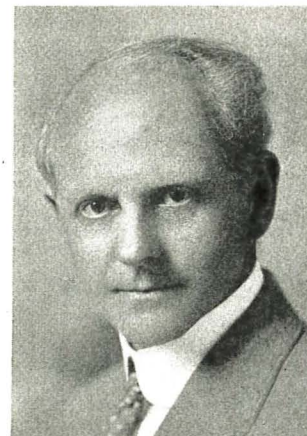
RAYMOND P. ENSIGN,
New York City.



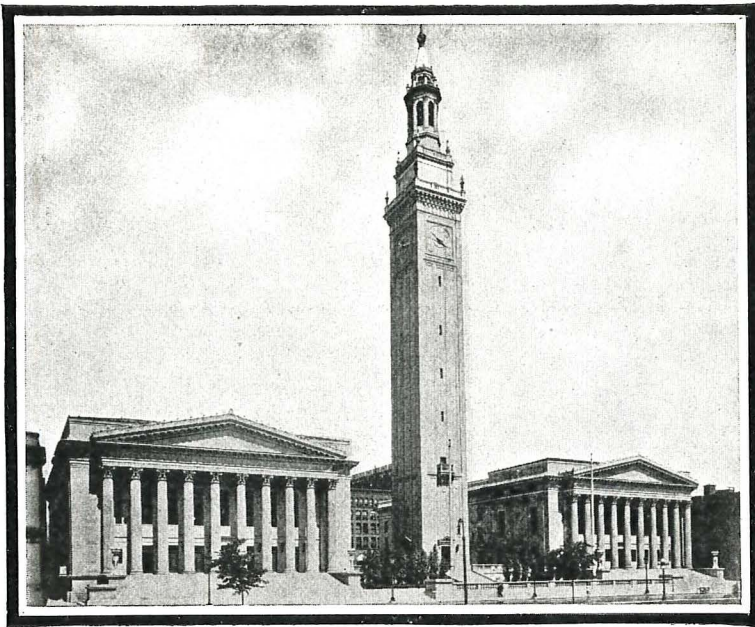
FREDERICK G. BONSER,
New York City.



MEYER BLOOMFIELD,
Boston.



HENRY TURNER BAILEY,
Boston.



MUNICIPAL GROUP, SPRINGFIELD, MASS.

The Art Craftsman, Mr. Henry H. Clark, Boston Museum, School of Fine Arts.

How Can We Bridge the Gap Between the Art School and the Business which Involves the Graphic Arts, Mr. Arthur S. Allen, Philip Ruxton Company, New York City.

Among the important round-table topics will be the following:

(A) Art in Illustrative Drawing for Elementary Children, Miss Lucia W. Dement, Horace Mann School, New York City.

(B) Compulsory Continuation Schools, Mr. Frank V. Thompson, Assistant Superintendent of Schools, Boston, Mass.

(C) Phases of Interior Decoration for Normal and College Students, Mr. Vesper L. George, Massachusetts Normal Art School, Boston, Mass.

(D) Present Phases of Vocational Education in Massachusetts, Mr. Robert O. Small, Deputy Commissioner of Education.

(E) The Time Factor in Manual Training for Elementary and High Schools, Mr. William R. Ward, Trenton, N. J.

The headquarters of the convention will be located in the Hotel Kimball. Inquiries concerning accommodations may be addressed to Mr. E. E. MacNary, chairman of the local committee.

THE WESTERN DRAWING AND MANUAL TRAINING ASSOCIATION.

The Grand Rapids Convention, May 3-6.

Reports gathered by the *Industrial-Arts Magazine* from the states comprising the territory from which the Western Drawing and Manual Training Association draws its largest attendance, indicate that the Grand Rapids convention will exceed in size all previous conventions of the organization. In fact, the delegations from Wisconsin, Iowa and Illinois are expected to be so large that the Pere Marquette Railroad will run a special train to the convention from Chicago, on the morning of May 3rd.

Mr. Vaughn, the president of the association, has been assured of the appearance of every speaker on the program, and the local authorities have made sure that all of the exhibits and all of the other local arrangements will be completed before the opening day of the meeting.

The Pantlind Hotel will be the official headquarters and the exhibits and the meetings will be held in the Klingman Furniture Exhibit

Building in the immediate neighborhood of the hotel. The program, in part, will be as follows:

Wednesday Afternoon, May 3.

General Session.

President's Address—Mr. S. J. Vaughn, Department of Manual Arts, State Normal School, DeKalb, Ill.

Art Training for Industry, Dr. C. A. Prosser, Director Dunwoody Institute, Minneapolis, Minn.

Art Round Table.

Art Training for Industry, Dr. James P. Haney, Director of Art, New York High Schools.

Subject and Method in the Arts Course for Public Schools, Miss Jeannette Buckley, Normal Department, Chicago Art Institute.

Furniture and Education, Mr. C. Matlack Price, Associate Editor, Good Furniture Magazine.

Wednesday Evening.

Banquet—Pantlind Hotel. Mr. Harry E. Wood, Supervisor of Manual Training, Indianapolis, Ind.

Thursday Morning, May 4.

Election of nominating committee and appointment of committees on resolutions and place of meeting.

Art Teaching in High Schools, Dr. James P. Haney, Director of Art, New York High Schools.

Address, Dr. Josephine T. Berry, Chief of the Division of Home Economics, University of Minnesota.

Thursday Evening.

Lecture—Privileges and Penalties of Our Task, Lorado Taft.

Friday Morning, May 5.

Education Looking Toward Vocation, Dr. Alfred W. Wishart, Grand Rapids, and Mr. George Whitworth, Berkey & Gay Furniture Co., Grand Rapids.

Creative Dressmaking, Madam Alla Ripley, President of the Fashion Art League of America, Chicago.

Prevocational Work, Elmer W. Cristy, Supervisor of Manual Training, Cincinnati, O.

Friday Evening.

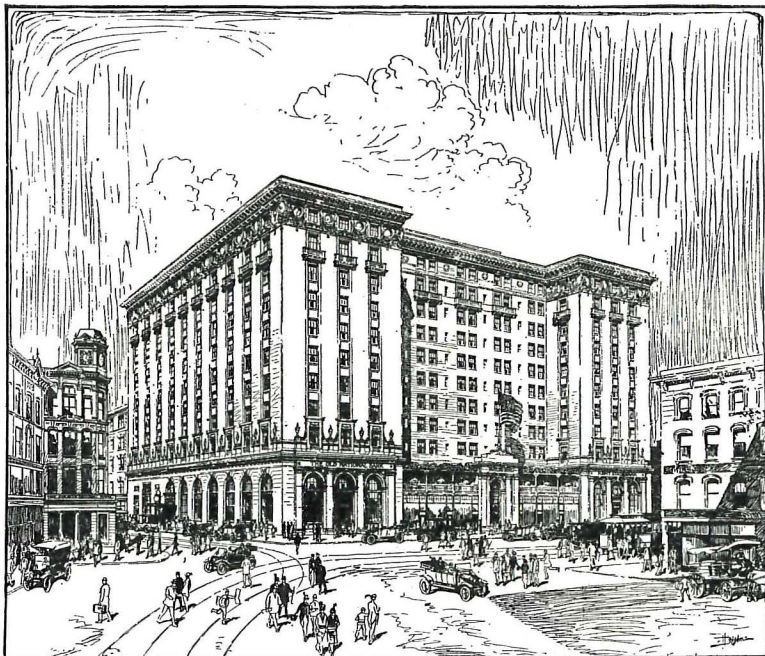
Mental Development Thru Drawing and Manual Training, Hon. W. N. Ferris, Governor of Michigan.

Democratization of the Arts, Supt. John D. Shoop, Chicago, Ill.

Saturday Morning, May 6.

Massachusetts Boy Scout Act, Mr. Charles H. Mills, Supervisor of Municipal Recreation, Grand Rapids, Mich.

Evening Schools Old and New, Mr. William J. Bogan, Lane Technical High School, Chicago.



THE PANTLIND HOTEL, GRAND RAPIDS, MICH.

An Invitation

De Kalb, Illinois.

The Western Drawing and Manual Training Association will hold its twenty-third annual meeting in Grand Rapids, May 3-6.

This association is one of the oldest and by far the largest organization of its kind in this country. Its annual reports constitute practically the only complete and authentic record of the development, changes, and growth of Art, Manual Training, Domestic Science, and related lines of work in the United States for the last twenty-three years.

The active, progressive leaders from all over the country and especially from the middle-western states attend the meetings of this association and contribute from their rich experience and achievement to the success of the meetings and to the enlightenment and profit of those present.

Commercial and educational exhibits are an attractive feature of these conventions. This year they will be of unusual size and excellence.

In the twenty-three years, we have not had a stronger program than the one prepared for this meeting.

All persons interested in the work for which this association stands are cordially invited to be present at the Grand Rapids meeting.

Sincerely yours,

S. J. VAUGHN, President.

In What Way Should the Vocational Movement Influence the Public School Art Courses? Miss Anna L. Cobb, Cleveland School of Art, Cleveland, O.

The round tables, which are three in number, are as follows:

Household Arts—Chairman, Miss Lauretta Morrissey, Supervisor of Household Arts, Grand Rapids.

The Relation of Home Economics to the Curriculum, Miss Georgia L. White, Dean of Home Economics, State Agricultural College, East Lansing, Mich.

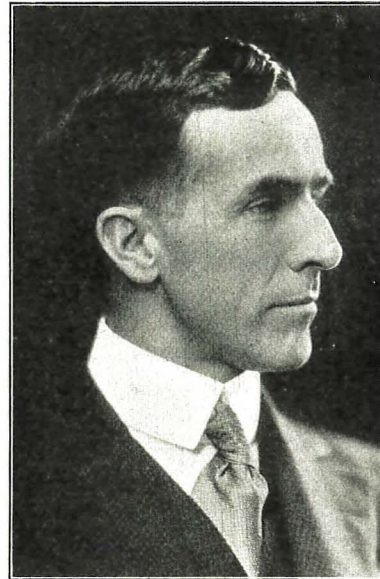
Some Phases of Home Economics in Hospital Administration, Miss Elizabeth Selden, Superintendent of Butterworth Hospital, Grand Rapids, Mich.

Courses of Study in Domestic Art in the Grades and the High School, and Their Inter-Relation with the Art Courses, Miss Martha H. French, Department of Home Economics, State Normal College, Ypsilanti, Mich.

Manual Training—Chairman, Mr. Geo. M. Brace, Department of Manual Training, St. Paul.

The Possibilities of Trade Instruction in the Regular High School Manual Training Department, Mr. Gustav B. Eggert, Arthur Hill Trade School, Saginaw, Mich.

Design in the Manual Arts, Prof. W. H. Varnum, University of Wisconsin.



MR. S. J. VAUGHN,
De Kalb, Ill.

Manual Training for Rural Schools, Prof. H. H. Musselman, Department of Farm Mechanics, Michigan Agricultural College.

Vocational—Chairman, Mr. C. A. Zuppann, Technical Department, Central High School, Minneapolis, Minn.

The Practical Designer in the Industries, Mr. Lachlan MacLachlan, Head Designer, Berkey & Gay Furniture Co., Grand Rapids, Mich.

Vocational Education for Girls, Miss Fish, Girls' Trade School, Minneapolis, Minn.

Non-Commissioned Officers of Industry, Dr. C. A. Prosser, Dunwoody Institute, Minneapolis.

PRINTING TEACHERS' CONVENTION.

The first annual convention of the International Association of Teachers of Printing, Central Section, will be held in Grand Rapids, May 3-6. These are also the dates of the meeting of the Western Drawing and Manual Training Association. Since Mr. S. J. Vaughn is president of both organizations, it has been possible to plan both the programs with a minimum of conflict of interests, so that the arrangement should be advantageous to both meetings.

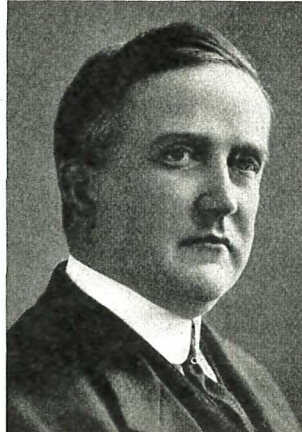
Well known teachers of printing from all parts of the Middle West will give addresses on various topics of interest to this group. Among those who are already planned for may be mentioned the following: Mr. Robert Rankin,



MR. LORADO TAFT,
Chicago, Ill.



MME. ALLA RIPLEY,
Chicago, Ill.



DR. C. A. PROSSER,
Minneapolis, Minn.



DR. JAMES P. HANEY,
New York City.

Duluth, Minn.; Miss Stilwell, Chicago University; Mr. J. Orville Wood, Cleveland; Mr. Hertenstein, St. Louis; Mr. Brown, University of Kansas; and Mr. Wahlstrom, Chicago.

Besides addresses by the teachers of printing, it is being arranged to have men from the commercial shops discuss certain phases of the work that will be helpful to teachers. Also, an address has been promised by Prof. Varnum of the University of Wisconsin, on "Color in Printing."

Those primarily interested in this organization will at the same time have an opportunity to attend meetings and see the exhibits of the Western Drawing and Manual Training Association. Such teachers of printing have also been asked to join the Western Drawing and Manual Training special train party from Chicago, Wednesday morning, May 3, if it is convenient for them to do so.

It is hoped that all the printing teachers in the Central Section may be able to spend May 3-6 in Grand Rapids.

Prizes for Problems and Projects.

The prizes for problems published in the Problems and Projects Department during the past three months are as follows:
 February—A. Clifford Tagg, Rock Island, Ill.
 March—Geo. M. Brace, St. Paul, Minn.
 April—J. H. McNeeley, Los Angeles, Cal.

C. A. Prosser, of Dunwoody Institute, Minneapolis, and W. H. Henderson, of the University of Wisconsin, have recently completed a Survey of the Vocational work offered in the public schools of Denver. This report will constitute one volume of the Survey of the entire public school system of the city. The report on Vocational Education is to include the elementary Manual Training, high school Manual Training, the work of the Trade School and evening schools. It will also include an investigation of the Commercial work in high schools and evening schools.



MR. L. R. ABBOTT,
Chairman of the Local Committee, Grand Rapids, Mich.

It is to outline a program of Vocational Education, including agreements with Trades and Industries of Denver, for the schools.

W. H. Henderson, of the University of Wisconsin, recently made a one week's study of the Manual Training, Commercial and Household Arts work in the Colorado Springs public schools for the Board of Education of that city. He recommended a complete reorganization of the Manual Training Department, adding printing, pattern-making, automobile repairing and construction and electrical work to the subjects taught in the high school. By moving the elementary shop work to the high school, experience in a wide variety of industrial activities will be offered to boys in the upper grades. The addition of a comprehensive course in salesmanship was also recommended.



KLINGMAN FURNITURE EXHIBIT BUILDING, GRAND RAPIDS, MICH.
 The meetings and the exhibits of the Western Drawing and Manual Training Association will be held in this building.

NEW BOOKS AND PAMPHLETS

Mechanical Drafting.

By Charles B. Howe. 147 pages. John Wiley & Sons, New York, N. Y.

A manual for teachers of mechanical drawing intended to assist the teacher in presenting the subject matter by supplying him with convention, data and problem sheets.

The manual does not present a course of study, but teachers may select and arrange a course which is adapted to his needs from the supplementary loose-leaf sheets which are published with the manual.

The author believes that the chief value of a knowledge of mechanical drawing is its utility as a medium of expression. With this in mind, the usual geometrical problems are not presented in this text, but it is devoted to the visualization of the object by the pupil, thru orthographic projection, the development of surfaces, and mechanical perspective.

Chapters on working drawings; machine drawing; drawings of buildings; plot and map drawing; pictorial representation; etching and blue printing are presented.

The Orders of Architecture.

By A. Benton Greenberg. Price, 50 cents net. John Wiley & Sons, New York City.

This is a loose-leaf drafting manual composed of a set of twenty plates illustrating the Tuscan, Doric, Ionic, Corinthian and Composite orders of Greek and Roman Architecture. They are prepared as exercises in practice drawing. The plates can be separated and used individually.

The names of parts, and explanatory notes are printed on the sheets. The proportions are given in terms of the diameter of the column at the base so that drawings may be made at any scale from them, and the related proportions of the orders will be committed by the draftsman.

Lumber and Its Uses.

By R. S. Kellogg. Cloth, 352 pages. Price, \$1, net. Sold by the Industrial-Arts Magazine, Milwaukee, Wis.

This authoritative work has been prepared by a leading student of lumber and wood products, and is the result of many years of experience and study. It takes up in detail, the structure and physical properties of wood, of grading, of lumber sizes, the seasoning of timber, preservation and finishing of wood and miscellaneous uses of wood for building, cabinetmaking, etc.

A large section of the book is devoted to a study of the leading commercial woods grown and used in the United States. Teachers of woodworking will be particularly interested in this portion of the book and in a section devoted to the commercial uses of wood. The book is thoroly illustrated and is carefully printed.

First Principles of Electricity.

By Oscar Werwath and associates. Cloth, large octavo, 104 pages. Price, \$1. Electroforce Publishing Co., Milwaukee, Wis.

This book is the first of a five volume library on practical electricity. It is the result of ten years of teaching electricity in a resident and correspondence school in which young men engaged in some field of electricity were enrolled. After an introductory chapter explaining the nature and common terms of electricity, batteries, wiring for bell circuits, alarm systems, clock systems and the telegraph are taken up. The language is simple and the illustrations are complete. Each of the seven chapters is followed by a set of laboratory experiments, a set of problems and a list of review questions. The book will be valuable for reference and general classwork and should appeal especially to the teacher who wishes to study independently.

Shop Problems.

Series No. 2. Edited by Albert F. Siepert. Price, 25 cents. The Manual Arts Press, Peoria, Ill.

This is the second set of shop problems collected by Mr. Siepert and printed by the Manual Arts Press on tracing paper, ready for blueprinting. Three pieces of playground apparatus are distinctly new as manual-training problems.

NEW BOOKS AND PAMPHLETS.

Home Projects in Secondary Courses in Agriculture. By H. P. Barrows, Assistant in Agricultural Education. Bulletin No. 346, United States Department of Agriculture, Washington. The pamphlet gives the essential principle underlying the home projects, the development of the idea in the schools, the essentials of a successful project and a number of project outlines.

Unemployment Among Women in Department and Other Retail Stores of Boston. Series No. 8, whole No. 182, United

States Department of Labor. The pamphlet gives the scope and method of investigation, the number of women having regular work only, women having both regular and extra work, women having extra work only, and a number of summary tables.

Summary of the Report on Condition of Woman and Child Wage Earners in the United States. Series No. 5, whole No. No. 175, United States Department of Labor. Contains the purpose and scope of the report, studies of the cotton textile industry, men's ready-made clothing, the glass industry, the silk industry, child-labor legislation in the United States, the conditions under which children leave school to go to work, juvenile delinquency and its relation to employment, history of women in industry in the United States, history of women in trades-unions, women in the metal trades, women in laundries, infant mortality and the employment of mothers, causes of death among women and child cotton-mill operatives, relation between occupation and criminality of women, family budgets of cotton-mill workers, hookworm disease, employment of women and children in selected industries, labor laws and factory conditions.

Retail Prices 1907 to June, 1915. Comparative statistics on retail prices and the cost of living gathered by the United States Bureau of Labor Statistics under the direction of Mr. Royal Meeker. Bulletin 184, United States Bureau of Labor Statistics.

The Pennsylvania Child Labor Act and Continuation Schools. Bulletin 5, Bureau of Vocational Education, Harrisburg, Pa. An informational pamphlet for school authorities including law and an interpretation of its provisions relating to the continuation schools.

Measurements for the Household. Circular No. 55, Bureau of Standards, United States Department of Commerce. S. W. Stratton, Director. The aim of the pamphlet is to give information on units, methods and instruments of measurement useful in households, to describe means for assuring correct quantities of purchased articles, and other facts of interest bearing on measurements in everyday life. The pamphlet takes up in detail, commodities, means of checking amounts, state laws, heat, refrigeration, light, electricity, gas, water, atmospheric humidity and pressure, density of liquids, time and kitchen measures. Three appendices contain tables for weights and measures.

Extension Course in Vegetable Foods. By Anna Barrows, Director of School of Domestic Science, Chautauqua, N. Y., and School of Household Arts, Columbia University. Bulletin No. 123, U. S. Department of Agriculture, States Relations Service. The pamphlet is intended for self-instruction classes in movable schools of agriculture. It discusses classification of plants, leaves, bulbs, tubers, succulent roots, flowers and fruit, seeds, fungi, condimental vegetables and food accessories, summary of cooking, drying, evaporating and salting, preserving and canning, pickling, cultivation of vegetables for home use and marketing. The appendix contains a number of references and a list of apparatus and supplies.

A successful birdhouse contest was that held for the first time at the Y. M. C. A. Building in Kalamazoo, Mich., during March. The contest was planned and carried out thru the co-operation of the secretary of the Association and Mr. George Waite of the Manual Arts Department of the schools. In all, 76 houses and shelters for a variety of birds, were entered. The prizes, nine in number, were awarded by a committee of three from the Western Normal School.

Chicago, Ill.—At the recent graduation exercises of the Harrison Technical High School, fifty senior carpenter apprentices were given diplomas. Exhibits of the boys' work in carpentry were shown to the visitors in attendance.

Springfield, Ill.—A course in shoe cobbling has been undertaken by one of the manual-training classes at the Palmer School. A small fee is charged for repairing shoes, but in the case of poor children, the work is done free.

Ralston, Ia.—Domestic science, agriculture and manual training have been introduced in the schools.

Saginaw, Mich.—A class in farm forging for farmers and their sons, was successfully conducted during the second school term. A total of eight students enrolled, each paying \$5 for the course.

Mr. Zeisler, instructor in Manual Training at Racine, Wis., has resigned to accept a position in the Engineering Department in Panama.

NOW, ARE THERE ANY QUESTIONS?

This department is intended for the convenience of subscribers who may have problems and questions which trouble them. The editors will reply to questions, which they feel they can answer, and to other questions they will obtain replies from persons who are competent to answer. Letters must invariably be signed with full name of inquirer. If an answer is desired by mail, a stamped envelope should be enclosed. Address, Editors, Industrial-Arts Magazine, Milwaukee, Wis.

Mill Races and Looms.

348. Q.—Will you please forward information on old-time "Mill Races," and the construction of the old water wheel, wooden turbine, etc., material from which I could have a miniature one constructed? Also, material, drawings, etc., of old looms and spinning wheels? —W. J. L.

A.—Can any reader of the *Industrial-Arts Magazine* suggest an authoritative reply to this inquiry?

Short Courses in Electricity.

370. Q.—I am desirous of taking a short practical course in electricity in some trade school of not more than one year. A six months' course would suit me even better.—E. J. K.

A.—Excellent short courses in electricity may be taken at Carnegie Institute of Technology, Pittsburgh; Lewis Institute, Chicago, and the Armour Institute of Technology, Chicago.

Hand Power Lathe.

375. Q.—I have no power in my small shop but if possible would like to put in a wood turning lathe. Do you know of any place where I could get a hand power lathe which would satisfactorily do the work? Lathe to do only light work.—C. H. D.

A.—The Millers Falls Company, Millers Falls, Mass.

Plaster Casts.

376. Q.—Would you please send me the address of a firm where I can get a plaster cast made of a plasticine model?—M. M. H.

A.—P. P. Caproni & Bro., Boston, Mass.; The Sculpture Arts Co., 118 W. Brookline St., Boston; C. Hennecke Co., 1353 N. Pierce St., Milwaukee, Wis.—W. C. B.

BOOKS ON MANUAL TRAINING WORK.

357. Q.—I am interested in books on Manual Training work, particularly on fancy designs in inlaid furniture work and would like information on same.—J. W. C.

A.—*Book of Decorative Furniture*. By Edwin Foley. Price, per set, \$15. Bruno Hessling Co., New York.

English Furniture Decoration and Wood Work. By T. A. Strange. \$5, net. American Architect, New York.

Modern Cabinetwork, Furniture and Filaments. By P. A. Wells and John Hooper. \$5, net. American Architect, New York.

Decorated Models for Woodwork. By Ketchum. \$0.58, postpaid. School Arts Publ. Co., Boston.

Decorative Period. C. R. Clifford. \$2. Grand Rapids Furniture Record Co., Grand Rapids, Mich.

French Furniture. By Andre Saglio. \$2.50. Grand Rapids Furniture Record Co.

Fancy Furniture. By G. C. Krause. \$2.50. Grand Rapids Furniture Record Co.

English Furniture and Decoration. By G. M. Ellwood. \$8.40. Grand Rapids Furniture Record Co.

Louis XIV Furniture of the Louvre and Museum of Decorative Arts. By E. and W. Hessling. \$13.40. Grand Rapids Furniture Record Co.

Heraldry for Craftsmen and Designers. By W. H. S. Hope. \$2.35. School Arts Publ. Co., Boston.

Cabinetmaker and Upholsterer. By Sheraton. Bruno Hessling Co., New York.

Furniture for the Craftsman. By P. D. Otter. \$1.50. Grand Rapids Furniture Record Co.; David Williams, New York.

Modern Cabinet Work. By Wells and Hooper. \$5. John Lane Co., New York.

Woodworking for Amateur Craftsmen. By I. S. Griffith. \$0.50. Popular Mechanics Co., Chicago.

Furniture Designing and Drafting. By Alvin Nye. \$2. Wm. T. Comstock Co., New York.

Sizing for Fresco Paint.

369. Q.—Will you please send recipe for sizing to be used with fresco paints?—H. E. G.

A.—For fresco on plaster walls, the common preparation of the wall is a thin priming coat of lead and oil paint, over which a glue size (glue and water) is used. Ready made commercial size can be secured which has a gum body diluted with turpentine.

The best old-fashioned recipe for size on plaster consists of two parts of powdered gum anini to eight parts of boiled linseed oil. This mixture is made by heating the oil to the point of burning and then reducing it by setting fire to it in a stone-ware basin. The powdered gum is added to the hot oil and the mixture is reduced to the consistency of a thick cream paste by burning. The fire can be extinguished by putting a close cover over the basin when the mixture is sufficiently reduced. The paste is then strained thru a fine meshed cloth and diluted with turpentine as used. A finely ground color may be added to it as desired.

The wall must be thoroly dry before the application of the size and the size must be thoroly dry before the addition of the fresco colors. The ground color should be dull (flat) if the oil is sufficiently reduced, and diluted with turpentine. Frescoes of particular importance are painted on light canvas, which is set to the wall in white lead. The canvas is painted with flat oil paint of any desired ground color.—E. J. Lake.

Concrete and Roof Work.

380. Q.—(1) Is there a book on the market that correlates practical woodwork and concrete? (2) Would also like to know of a good book on the details of rafter cutting.—E. C. S.

A.—(1) The making of forms for all kinds of concrete work is fully described in Radford's *Cyclopedia of Cement Construction*. (Radford Architectural Co., Chicago).

The making of forms is also described in three bulletins prepared and issued by the Association of American Portland Cement Manufacturers—"Manual Training Course in Concrete," "Simple Forms," and "Practical Hints on Concrete Construction." The price of the first is \$0.25.

(2) *Radford's Framing*. Price, \$1. Radford Architectural Co., Chicago.

Books on Farm Projects.

384. Q.—I would like to know where I could get some good plans for farm projects, such as farm buildings.—T. E. R.

A.—The following books will be helpful:

Farm Shop Work. By G. M. Brace and D. D. Mayne. \$1. American Book Co., New York, Chicago.

Silos. By M. L. Kind. \$0.50. Webb Publishing Co., St. Paul, Minn.

Dewey's Blueprints. By L. C. Dewey, Denver, Colo.

Poultry Architecture. By G. B. Fiske. \$0.50. Manual Arts Press, Peoria, Ill.

Farm Machinery and Farm Motors. By Davidson and Chase. \$2. Manual Arts Press, Peoria, Ill.

Farm Buildings. \$2. Manual Arts Press, Peoria, Ill.

Poultry Appliances and Handicrafts. By G. B. Fiske. \$0.50. Manual Arts Press, Peoria, Ill.

Barn Plans and Out Buildings. By Edwin C. Powell. \$1. Manual Arts Press, Peoria, Ill.

Work Shop Note Book. By G. G. Green. \$0.25. Manual Arts Press, Peoria, Ill.

Bottles.

392. Q.—For the paint shelf we are always in need of vessels or cups for the student to work from. Many use tin cans but spirit stains are affected by their use at times so we need glass vessels. Where can we get them?—C. K.

A.—It is taken for granted that economy has a hand in the choice of vessels. We use bottles—round ones preferred—such as beer bottles, or the containers of some stains, etc. To cut these off all that one needs to do is to hold the bottle on the edge of an emery wheel and turn the bottle slowly, grinding a ring where the cut is desired and about the third turn the bottle will come in two. We find this very handy, also quickly and cheaply done.—H. G. Singer.

Sugi-ing Cypress.

397. Q.—Please tell me in detail how to apply "Sugi" finish to cypress.—L. G. M.

A.—See Cypress Pocket Library, Volume 26, issued by the Southern Cypress Manufacturers Association, New Orleans, La. Copies free to teachers